

This article was downloaded by: [Tomsk State University of Control Systems and Radio]

On: 23 February 2013, At: 07:47

Publisher: Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954

Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Molecular Crystals and Liquid Crystals

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/gmcl16>

Spectroscopy of Molecular Crystals: A Bibliography for 1971

E. F. Sheka^a, A. I. Morosova^a & E. F. Sheka^a

^a Institute of Solid State Physics Academy of Sciences of the U.S.S.R., Chernogolovka

Version of record first published: 28 Mar 2007.

To cite this article: E. F. Sheka, A. I. Morosova & E. F. Sheka (1973): Spectroscopy of Molecular Crystals: A Bibliography for 1971, *Molecular Crystals and Liquid Crystals*, 19:3-4, 331-367

To link to this article: <http://dx.doi.org/10.1080/15421407308084663>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.tandfonline.com/page/terms-and-conditions>

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages

whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Spectroscopy of Molecular Crystals: A Bibliography for 1971

Compiled by E. F. SHEKA and A. I. MOROSOVA
 Edited by E. F. SHEKA

Institute of Solid State Physics
 Academy of Sciences of the U.S.S.R.
 Chernogolovka

Contents

1. Introduction	332
2. Books and Reports of Meetings	332
3. Spectra of Aromatic Molecules in Gaseous and Condensed States	334
1. Electronic States	334
2. Singlet Absorption Spectra	336
3. Triplet Absorption Spectra and ESR Spectra	337
4. Electronic-vibrational Interaction and Vibronic Spectra	338
5. Vibrational Spectra	339
6. Fluorescence	340
7. Phosphorescence	341
8. Dissipation and Migration of Molecular Excitation Energy, Time Constants	342
9. Laser Excitation, Stimulated Emission and Light Generation	345
10. Spectroscopy of Photochemical Reactions	346
4. Absorption and Luminescence Spectra of Intermolecular Complexes	346
1. Charge-transfer Complexes	346
2. Excimers, Dimers and Other Homomolecular Complexes	347
5. Spectra of Pure Molecular Crystals	349
1. Electronic and Vibronic States and Absorption Spectra	349
2. Vibrational and Phonon Spectra	350
3. Fluorescence and Phosphorescence	351

6. Spectra of Impurity Molecular Crystals	352
7. Exciton Problem of Molecular Crystals	354
1. Lattice Dynamics and Phonon Spectra	354
2. Singlet Excitons and Cooperative Effects	355
3. Triplet Excitons	356
4. Exciton-phonon Interaction (shape of bands, energy dissipation, vibronic spectra)	357
5. Excitons in Mixed Crystals	358
6. Excitonic Mechanism of Energy Migration	359
8. Photoconductivity of Molecular Crystals. Photoelectronic Emission	360
9. Effects of High Exciton Concentration in Non-metallic Crystals	361
10. Excitons and Magnons in Antiferromagnetic Crystals	362
11. Molecular Crystal Structure	366
12. Neutron Study of Phonon Spectra	366
13. Some Experimental Techniques	367
14. Author Index	367

1. Introduction

The 1971 Bibliography continues the series of annual issues of Bibliographies "Spectroscopy of Molecular Crystals". The full list of these issues for 1957-1968 may be found in *Molecular Crystals and Liquid Crystals*, **6**, 175, 1969. The issues for 1969 and 1970 are published *ibid.* **14**, 329 (1971) and **17**, 55, (1972). As the two previous issues, the 1971 Bibliography is established on the basis of scientific-bibliography work carried out in the Institute of Solid State Physics in Chernogolovka. In addition to references to papers published in 1971, this issue contains references concerning publications in 1969 and 1970. Especially it refers to the books and proceedings of the international Symposia and conferences.

2. Books and Reports of Meetings

ASPECTS of modern quantum chemistry. (Aspects de la chimie quantique contemporaine. Menton, 8-13 Juillet 1970). 15, Quai Anatole-France-Paris-VIIE. (Colloques Internationaux du Centre National de la Recherche Scientifique. N 195) (1971) (Fr).
 ATKINS, P. W., *Molecular quantum mechanics. An introduction to quantum chemistry.* Oxford, Clarendon Press (1970) (Eng).
 BASS, M., DEUTSCH, T. and WEBER, M., "Dye lasers", *Usp. Fiz. Nauk* **105**, N 3, 521-573 (1971) (Russ).

- BERSUKER, I. B., *Structure and properties of coordinated compounds. Introduction to theory*. Moscow, Khimiya (1971) (Russ).
- BIRKS, J. B. and MUNRO, I. H., "The fluorescence lifetimes of aromatic molecules", *Usp. Fiz. Nauk* 105, N 2, 251-305 (1971) (Russ).
- BIRKS, J. B., *Photophysics of aromatic molecules*. New York, Wiley-Interscience (1970).
- BIRYUKOV, B. P. and STRUCHKOV, YU. T., "Structural chemistry of π -complexes of transient metals with carbonyl ligands. Part 2. Carbonyl π -complexes with metal-metal bonds", in: *Kristalloghimiya* 7, pt 2, 142-239, Moscow (1971) (Russ).
- BRITAIN, E. F. H., GEORGE, W. O. and WELLS, C. H. J., *Introduction to Molecular spectroscopy: theory and experiment*. London, Academia Press (1970) (Eng).
- BURDETT, J. K., "Electronic relaxation and molecular vibrations", *Appl. Spectrosc. Revs.* 4, N 1, 43-96 (1970) (Eng).
- CHANG, I. F. and MITRA, S. S., "Long wavelength optical phonons in mixed crystals", *Adv. Phys.* 20, N 85, 359-404 (1971) (Eng).
- COHEN, M. D., Ed., *Organic solid-state-2(IUPAC)*. Plenary lectures presented at the 11th International Symposium on Organic Solid-State Chemistry held in Rehovot, Israel, 14-18 September, 1970. Elsevier/North-Holland (1971).
- CONFERENCE on scintillator and liquid scintillation counting, San Francisco, Calif. USA, 7-10 July 1970. San Francisco, Calif., USA: Univ. Calif. (1970) (P.A. 74: 8295).
- DEMAS, J. N. and CROSBY, G. A., "The measurement of photoluminescence quantum yields. A review", *J. Phys. Chem.* 75, N 8, 991-1024 (1971) (Eng).
- DRESSLER, K., "Matrix isolation spectroscopy", *Mem. Soc. R. Sci. Liege* 8° (Belgium) 5, N 20, 357-374 (1970) (P.A. 74: 54952).
- ELECTRICAL conduction in organic solids. (Discussions of the Faraday Soc. N 51). London (1971).
- ENERGY transfer in condensed media, Erevan. (Trudy pervogo Vsesoyznogo seminar po peredache energii v kondensirovannykh sredakh, Lori, Armenia 6-12 Oct 1969) (Proceedings of the first All-Union seminar on energy transfer in condensed media, Lori, Armenia 6-12 Oct 1969) (1970) (Russ).
- EIGHTH Australian spectroscopy conference. Abstracts. Conference held at: Clayton, Australia. Date: 16-20 Aug. 1971. Clayton, Australia: Monash University (1971) (P.A. 75: 8509).
- EVANS, T. R., "Photochemical methods", in: *Technique of organic chemistry*. Vol. 14. Energy transfer and organic photochemistry. New York, Interscience Publ., 297-348 (1969) (Eng).
- FLETCHER, G. C., *The electron band theory of solids*. Amsterdam and London, North-Holland (1971) (P.A. 75: 6721).
- FORST, W., "Methods for calculating energy-level densities", *Chem. Revs.* 71, N 4, 339-56 (1971) (Eng).
- GRINBERG, A. A., *Introduction to chemistry of complex compounds*. Leningrad, Khimiya (1971) (Russ).
- HOARE, M. R. and PAL, P., "Physical cluster mechanics: statics and energy surfaces for monoatomic systems", *Adv. Phys.* 20, N 84, 161-196 (1971) (Eng).
- HULTSCH, R., "Correlations between active and passive parameters of solid state laser media", *Phys. Stat. Sol. (a)* 7, N 1, 13-46 (1971) (Eng).
- JØRGENSEN, C. K., *Modern Aspects of ligand field theory*. Amsterdam, North-Holland (1971).
- KITAIGORODSKIY, A. I., *Molecular Crystals*. Moscow, Nauka (1971) (Russ).
- KONEY, S. and VOLOTOVSKIY, I. D., *Introduction to molecular photobiology*. Minck, Nauka and Tekhnika (1971) (Russ).
- KORTUM, G., *Reflection spectroscopy*. Berlin, Springer (1969).
- KULAKOV, Yu. I., "On a new kind of symmetry underlying physical theories of phenomenological type", *Dokl. Akad. Nauk SSSR* 202, N 3, 570-572 (1971) (Russ).
- KURIK, M. V., "Urbach rule", *Phys. Stat. Sol. (a)* 8, N 1, 9-45 (1971) (Eng) (P.A. 75: 4453).
- LIM, E. C., Ed., *Molecular luminescence. An international conference*. New York-Amsterdam, W. A. Benjamin, Inc. (1969) (Eng).
- LABARR, G. F. and GALLE, F., "Faraday effect, new method of molecular structure studies", *Usp. Khim.* 40, N 4, 654-693 (1971) (Russ).
- LAMOLA, A. A., "Electronic energy transfer in solution: theory and applications", in: *Technique of organic chemistry*. Vol. 14. Energy transfer and organic photochemistry, New York, Interscience Publ., 17-132 (1969) (Eng).
- LEERMAKERS, P. A. and WEISSBERGER, A., Eds., *Technique of organic chemistry*. Vol. 14. Energy transfer and organic photochemistry, New York, Interscience Publ. (1969) (Eng).
- LEERMAKERS, P. A., "Fundamental concepts", in: *Technique of organic chemistry*. Vol. 14. Energy transfer and organic photochemistry, New York, Interscience Publ., 1-16 (1969) (Eng).
- LYNCH, M., HARRISON, J. M., TOWN, W. G. and ASH, J., *Computer handling of chemical structure information*. New York, London, Amer. Elsevier Macdonald (1971) (Eng).
- LUTZ, U., "Lattice dynamics of anthracene". Doct. diss. Naturwiss., Eidgenöss. Techn. Hochschule Zürich (1970) (Ger).
- MARSHALL, W. and LOVESEY, S. W., "Theory of thermal neutron scattering: the use of neutrons for the investigation of condensed matter." (The International Series of monographs on physics), Oxford: Clarendon Press; London: Oxford University Press (1971).
- MASON, R., "Molecular crystals: intermolecular potentials and equilibrium structures," in: *Perspectives in structural chemistry*. Vol. 3. Ed. J. D. Dunitz, J. A. Ibers. New York-London-Sydney-Toronto, John Wiley and Sons, 59-90 (1970).
- MEYER, B., *Low temperature spectroscopy: optical properties of molecules in matrices, mixed crystals, and frozen solutions*. New York: American Elsevier Publishing Company, Inc.: Amsterdam: Elsevier Publishing Company (1971).
- MONOD-HERZEN, G. E., "Research on luminescence. II. Experimental research", *Bull. Soc. Sci. Bretagne* 65, 1-112 (1970) (P.A. 74: 9906).
- MOROZOV, V. P. and ROSSIKHIN, V. V., "On nonempirical force constants of small molecules", *Usp. Khim.* 40, N 2, 349-367 (1971) (Russ).
- MOROZOVA, A. I. and SHEKA, E. F., "Spectroscopy of molecular crystals: a bibliography for 1969", *Mol. Cryst. and Liq. Cryst.* 4, N 3-4, 329-380 (1971) (Eng) (P.A. 74: 69905).
- MURRELL, J. N., *The theory of the electronic spectra of organic molecules*. London, Chapman and Hall (1971).
- OSIPOV, O. A., MINKIN, V. I. and GARNOVSKIY, A. D., *Handbook on dipole moments*. Moscow, Vysshaya shkola (1971) (Russ).
- PIMENTAL, G. C. and SPRATLEY, R. D., *Chemical bonding clarified through quantum mechanics*. San Francisco, Holden-Day (1970).

- PINCHERLE, L., *Electronic energy bands in solids*. University physics series. London: Macdonald and Co. (Publishers), Ltd. (1971).
- PHONONS. Université de Rennes. July 26-29. Abstracts. p.A1/1-J 12/1 (1971).
- RAO, C. N. R., BHAT, S. N. and DWIVEDI, P. C., "Spectroscopy of electron donor-acceptor systems", *Appl. Spect. Revs.* 5, N 1, 1-170 (1971) (Eng).
- REBANE, K. and SILD, O., "An international seminar 'The selected problems of the theory of the impurity centre of crystals' (Tallinn, September 21-26, 1970)", *Usp. Fiz. Nauk* 103, N 4, 776-781 (1971) (Russ).
- SHEKA, E. F., "Electron-vibrational spectra of molecules and crystals", *Usp. Fiz. Nauk* 104, N 4, 593-643 (1971) (Russ).
- SIMON, W. and CLERC, T., *Structural analysis of organic compounds by spectroscopic methods*. London-New York, Macdonald Amer. Elsevier (1971).
- SMITH, R. A., "Lasers and light scattering", *Proc. Roy. Soc. London* A323, N 1554, 305-320 (1971) (Eng).
- SNYDER, J. P., Ed., *Nonbenzenoid aromatics*. Vol. 1. New York, Academic Press (1969).
- SOROKO, L. M., *Fundamentals of holography and coherent optics*. Moscow, Nauka (1971) (Russ).
- SUMI, H. and TOYOZAWA, Y., *Urbach-Martienssen rule and exciton trapped momentarily by lattice vibrations*. Tokyo, Inst. for Solid State Physics, Univ. of Tokyo (1971).
- TENTH European congress on molecular spectroscopy. In: *Mem. Soc. R. Sci. Liege* 8° (Belgium) 5, N 20 (1970) (P.A. 74: 56153).
- TIMOFEEV, V. B. and SHEKA, E. F., "VI All-Union seminar 'Excitons in crystals'", *Usp. Fiz. Nauk* 104, N 3, 515-517 (1971) (Russ).
- TRIGOLE, D. J., BARNARD, E. and MORAN, J. F., *Ligand interactions*. New York, Academic Press (1971).
- TURRO, N. J., "Photochemical reactions of organic molecules", In: *Technique of organic chemistry*. Vol. 14. Energy transfer and organic photochemistry. New York, Interscience Publ., 133-296 (1969) (Eng).
- TWENTY-SIXTH Symposium on molecular structure and spectroscopy. Abstracts. Conference held at: Columbus, Ohio, USA, Date: 14-18 Jun 1971. Columbus, Ohio, USA: Ohio State Univ. (1971) (P.A. 75: 8521).
- WIGNER, E. P., *Symmetries and reflections*. Bloomington-London, Indian University Press (1970) (Eng).
- WINTERTON, R. H. S., "Van der Waals forces", *Contemp. Phys.* 11, N 6, 559 (1970).
- WOODWARD, R. E. and HOFFMANN, R., *The conservation of orbital symmetry*. Weinheim (1970) (Eng).
- WYCKOFF, K. W. G., *Crystal structures*. Vol. 6: The structure of benzene derivatives. Part 2: molecules containing more than one benzene ring. Second edition, New York and London: Interscience Publishers, a Division of John Wiley and Sons, Inc. (1971).
- YAMAKAWA, H., *Modern theory of polymer solutions*. New York, Harper and Row (1971).
- ZHDANOV, Yu. A., *Theory of organic compound structure*. Moscow, Vysshaya shkola (1971) (Russ).

3. Spectra of Aromatic Molecules in Gaseous and Condensed States

3.1. Electronic States

- AMOS, A. T. and ROBERTS, H. G. FF., "The calculation of chemical shifts in conjugated molecules I. A current density approach", *Mol. Phys.* 20, N 6, 1073-1080 (1971) (Eng).
- AMOS, A. T. and BURROWS, B. L., "Perturbation theory for excited states of molecules. I", *Theor. Chim. Acta* 22, N 3, 288-290 (1971) (Eng).
- ANDRE, J. M., DELHALLE, J., FRIPAT, J. G. and LEROY, G., "Computation of LCAO wavefunctions for ground states of polymers and solids", *Int. J. Quantum. Chem.* 5, N 1, 67-84 (1971) (Eng).
- BARRIE PEEL, J. B., "Valence-electron calculations of molecules containing second-row atoms", In: 8th Australian spectroscopy conference. Abstracts, Clayton, Australia, 16-20 Aug 1971. Clayton, Australia: Monash University, P2 (1971) (P.A. 75: 8544).
- BASILEVSKY, M. V., TIKHOMIROV, V. A. and CHLENOV, I. E., "The potential surfaces for the addition reactions of π -systems", *Theor. Chim. Acta* 23, N 1, 75-92 (1971) (Eng).
- BOON, M. R., "Bond length alternation in infinitely long conjugated polyacenes", *Theor. Chim. Acta* 23, N 1, 109-110 (1971) (Eng).
- BRUGMAN, C. J. M., VAN ASSELT, N. P., RETTSCHNICK, R. P. H. and HOYTINK, G. J., "Molecules in molecules calculations on decaeycene", *Theor. Chim. Acta* 23, N 1, 105-108 (1971) (Eng).
- BUCHER, H. and KUHN, H., "Difference between ground and excited state dipole moments and polarizabilities as determined from electrochromism of Scheibe-dye-aggregates in monolayer assemblies", *Z. Naturforsch.* 25b, N 12, 1323-1327 (1970) (Eng).
- COLTHUP, N. B. and ORLOFF, M. K., "A molecular orbital study of the 'Kekulé' vibration assignment in benzene", *Chem. Phys. Letters* 12, N 2, 434-436 (1971) (Eng).
- DE BRUIJN, S., " π -Electron correlation in alternant hydrocarbons: bond order-bond length relation, force constants and the spectroscopic, vibrational and thermochemical β -values", *Theor. Chim. Acta* 18, N 1, 34-43 (1970) (Eng).
- DUKE, B. J., "The 3-centre bond non-paired spatial orbital method (NPSO)", *Theor. Chim. Acta* 23, N 2, 175-182 (1971) (Eng).
- EISENBERGER, P. and MARRA, W. C., "Identification of localized bonds in the hydrocarbons", *Phys. Rev. Letters* 27, N 21, 1413-1416 (1971) (Eng) (P.A. 75: 3103).
- EISENTHAL, K. B. and RIECKHOFF, K. E., "Polarizability of molecules in excited electronic states", *J. Chem. Phys.* 55, N 7, 3317-3327 (1971) (Eng).
- GIVAN, R. M., JR. and RICE, S. A., "Correlation of π -electron density with vibrational frequencies of linear-polyenes", *J. Chem. Phys.* 55, N 6, 2675-2681 (1971) (Eng).
- GOTEBIEWSKI, A. and PARCZEWSKI, A., "Note on the unsymmetrical form of biphenyl in its first excited state and the ionic state", *Z. Naturforsch.* 26a, N 1, 180 (1971) (Eng) (P.A. 74: 23396).
- HARRIS, R. A. and FALICOV, L. M., "Theory of n to π transitions", *J. Chem. Phys.* 55, N 6, 2981-2936 (1971) (Eng).
- HEGYI, M. G., MEZEI, M. and SZONDY, T., "Determination of molecular properties by the method of moments. III", *Theor. Chim. Acta* 21, N 2, 168-175 (1971) (Eng).
- HERNDON, W. C., "Unparameterized localized orbital calculations for saturated hydrocarbons", *Chem. Phys. Letters* 10, N 4, 460-464 (1971) (Eng).

- HIRST, D. M. and LININGTON, M. E., "The method of non-paired spatial orbitals: naphthalene and azulene", *Theor. Chim. Acta* 22, N 4, 315-324 (1971) (Eng).
- HOCHSTRASSER, R. M. and NOE, L. J., "Excited state dipole moments of benzophenone in singlet and triplet $n\pi$ states", *J. Mol. Spectrosc.* 38, N 1, 175-180 (1971) (Eng) (P.A. 74: 44010).
- INGHAM, K. C., "Hindered internal rotation in *o*-xylene", In: Univ. Colorado, Boulder, USA, thesis, 1970, 131 pp. Available from Univ. Microfilms, Ann Arbor, USA Order No. 70-23721 (Eng) (P.A. 74: 61093).
- JANIAK, M. J., HARTFORD, A., Jr. and LOMBARDI, J. R., "Dipole moment in the B_2 state of *p*-chloro-fluorobenzene", *J. Chem. Phys.* 54, N 6, 2449-2752 (1971) (Eng) (P.A. 74: 30178).
- JUG, K., "Operator equations in approximate molecular orbital theories", *Theor. Chim. Acta* 23, N 2, 183-194 (1971) (Eng).
- KADOMTSEV, B. B. and KUDRYAVTSEV, V. S., "Molecules in an ultrastrong magnetic field", *Zh. Eksp. Teor. Fiz. Pis'ma* 13, N 1, 15-18 (1971) (Russ).
- KARLOV, N. V., KONEV, Yu. B. and PROKHOROV, A. M., "On laser application to selective breaking of chemical bonds", *Zh. Eksp. Teor. Fiz. Pis'ma* 14, N 3, 178-181 (1971) (Russ).
- KIMMEL, H. S., "The application of Gordy's rule to monosubstituted phenyl compounds. The nature of the phenyl-X bond", In: 26th symposium on molecular structure and spectroscopy. Abstracts. Columbus, Ohio, USA, 14-18 Jun 1971. Columbus, Ohio, USA: Ohio State Univ., 75-76 (1971) (P.A. 75: 8810).
- KISS, A. I. and SZÖKE, J., "Pi-electron SCF MO calculations for mono-substituted derivatives of benzene", *Chem. Phys. Letters* 11, N 1, 52-54 (1971) (Eng).
- KNOP, J. V. and KNOP, L., "CNDO-investigations of steric hindrance in *cis*-stilbene", *Z. Phys. Chem. Frankfurt* 71, N 1-3, 9-13 (1970) (Ger) (P.A. 74: 8293).
- LADÁNYI, K., LENGYEL, V. and SZONDY, T., "Determination of molecular properties by the method of moments. IV. Scattering problems", *Theor. Chim. Acta* 21, N 2, 176-184 (1971) (Eng).
- LAVALLETTE, D., TETREAU, C. and LANGECLAAR, J., "SCF MO calculations on excited singlet-singlet and triplet-triplet transitions of 1,2-, 3,4-dibenzanthracenes, 1,12-benzperylene and 3,4-benzcoronene", *Chem. Phys. Letters* 9, N 4, 319-322 (1971) (Eng) (P.A. 74: 47683).
- LEIBOVICI, C., "Dipole moment of the first-excited $\pi \rightarrow \pi$ state of fluorobenzene", *J. Chem. Phys.* 54, N 11, 4966-4967 (1971) (Eng) (P.A. 74: 44024).
- LINSLEY, F. W., Jr., BRADSHAW, J. S. and HALL, H. T., "High pressure effects on conjugated aromatic compounds", *Rev. Phys. Chem. Japan* 40, N 2, 69-72 (1970) (Eng).
- LJUNGGREN, S. and WETTERMARK, G., "A CNDO/2 study of the mechanism of isomerization and conformation of azobenzene", *Acta Chem. Scand.* 25, N 5, 1599-1606 (1971) (Eng).
- MACLAGAN, R. G. A. R., "A new approach to the definition of the effective atomic-charge calculated from molecular wavefunctions", *Chem. Phys. Letters* 8, N 1, 114-116 (1971) (Eng).
- MAGGIORA, G. M., GENSON, D. W., CHRISTOFFERSEN, R. E. and CHENEY, B. V., "Ab initio calculations on large molecules using molecular fragments. First order electronic properties for hydrocarbons", *Theor. Chim. Acta* 22, N 4, 337-352 (1971) (Eng).
- MÄRTENSSON, O., "Valence charge distribution in pyrrole and furan", *J. Mol. Structure* 9, N 4, 455-463 (1971) (Eng) (P.A. 75: 5992).
- NAEF, W. T., COMPTON, R. N. and COOPER, C. D., "Attachment of electrons to substituted benzenes", *J. Chem. Phys.* 54, N 1, 212-222 (1971) (Eng).
- OTTOLENGHI, M., "On the photolionization of aromatic molecules in polar liquids", *Chem. Phys. Letters* 12, N 2, 339-343 (1971) (Eng).
- PALMER, M. H. and GASKELL, A. J., "Ab initio molecular orbital calculations. I. Minimal basis calculations on furan, pyrrole and 1,2,5-oxadiazole", *Theor. Chim. Acta* 23, N 1, 52-8 (1971) (Eng).
- PEARSON, R. G., "The structure of molecules in excited electronic states", *Chem. Phys. Letters* 10, N 1, 31-34 (1971) (Eng).
- PETRASHEN', A. G. and REBANE, T. K., "On the construction of symmetry coordinates and the symmetry orbitals in the theory of the electronic and vibrational spectra of molecules", *Vestn. Leningr. Univ. Fiz. Khim.* N 22, 34-37 (1970) (Russ).
- POLITZER, P. and STOUT, E. W. Jr., "Properties of atoms in molecules. The position of the center of electronic charge of an atom in a molecule", *Chem. Phys. Letters* 8, N 6, 519-522 (1971) (Eng).
- POPLE, J. A., "The calculation of wavefunctions taking account of all electrons", In: *Aspects of modern quantum chemistry*. (Aspects de la chimie quantique contemporaine). Menton 8-13 Juillet 1970. 15, Quai Anatole-France-Paris-VIIE, Centre National de la Recherche Scientifique, 17-48 (1971) (Eng).
- POZHELA, I. P., RADVILAVICHYUS, C. H. V. and BOLOTIN, A. B., "A theoretical investigation of 1,12-benzperylene", *Litov. Fiz. Sb.* 11, N 1, 49-56 (1971) (Russ) (P.A. 74: 75831).
- PRICE, W. C., "Photoelectron spectroscopy and molecular orbital structure", In: 8th Australian spectroscopy conference. Abstracts, Clayton, Australia, 16-20 Aug 1971. Clayton, Australia: Monash University, J1 (1971) (P.A. 75: 8564).
- ROBERTS, H. G. F. and AMOS, A. T., "The calculation of chemical shifts in conjugated molecules II. A semi-rigorous calculation of the pi-electron contribution to the magnetic properties of benzene", *Mol. Phys.* 20, N 6, 1081-1087 (1971) (Eng).
- ROBERTS, H. G. F. and AMOS, A. T., "The calculation of chemical shifts in conjugated molecules III. The test dipole method", *Mol. Phys.* 20, N 6, 1089-1098 (1971) (Eng).
- ROBY, K. K., "Some new developments in the molecular orbital theory of ground and excited states", In: 8th Australian spectroscopy conference. Abstracts, Clayton, Australia, 16-20 Aug 1971. Clayton, Australia: Monash University, P6 (1971) (P.A. 75: 8545).
- SALAHUB, D. R. and SANDORFY, C., "CNDO, INDO and RCNDO-CI calculations on the electronic spectra of saturated hydrocarbons", *Theor. Chim. Acta* 20, N 3, 227-242 (1971) (Eng).
- SALAHUB, D. R., "Semi-empirical MO-CI calculations on excited states III. Saturated molecules", *Theor. Chim. Acta* 22, N 4, 325-329 (1971) (Eng).
- SALAHUB, D. R., "Semi-empirical MO-CI calculations on excited states IV. Unsaturated molecules", *Theor. Chim. Acta* 22, N 4, 330-336 (1971) (Eng).
- SCHERR, V. M. and HAWORTH, D. T., "A semiempirical molecular orbital calculation of borazine and some B-trifluoroborazines", *Theor. Chim. Acta* 21, N 2, 143-148 (1971) (Eng).
- SIMON, J.-C. and PUJOL, L., "The influence of effective nuclear σ and π charges on LCAO-MO-SCF- π calculations", *Theor. Chim. Acta* 21, N 2, 191-198 (1971) (Fr).

- TINLAND, B. and DECORET, C., "A CNDO CI study of the electronic structure of benzophenone", *Spectrosc. Letters* 3, N 11-12, 345-348 (1971) (Eng).
- UZHINOV, B. M., "The dipole moments and polarizabilities of singlet excited states of phenanthrene", *Spectrochim. Acta* 26A, N 12, 2381-2382 (1970) (Eng).
- VARMA, C. A. G. O. and OOSTERHOFF, L. J., "The polarizability of tetracene in its first excited singlet state", *Chem. Phys. Letters* 8, N 1, 1-8 (1971) (Eng) (P.A. 74: 20852).
- VINOGRADOVA, N. P., ZHUKOVA, N. A. and CHEKALIN, M. A., "Alkalinity and electron spectra of some azonaphthalenes", *Zh. Prikl. Spektrosk.* 15, N 5, 932-934 (1971) (Russ).
- YAMAGUCHI, H. and NAKAJIMA, T., "Electronic structures, electronic spectra, and aromatic characteristics of peri-condensed tetracyclic nonbenzenoid aromatic hydrocarbons containing a naphthalene nucleus", *Bull. Chem. Soc. Japan* 44, N 3, 682-686 (1971) (Eng).
- YAMAZAKI, H. and SHINAKA, K., "A theoretical consideration of the electron-scavenging process in liquid hydrocarbons. II. Pulse irradiation", *Bull. Chem. Soc. Japan* 44, N 10, 2611-5 (1971) (Eng).
- YOSHIDA, Z. and KOBAYASHI, T., "Electronic spectra and structures of organic π -systems. II. SCFMO calculations of five- and six-membered heterocyclic systems, quinones, tropone, tropolone and sulphur-containing systems with the variable integrals methods", *Theor. Chim. Acta* 20, N 3, 216-226 (1971) (Eng).
- ### 3.2. Singlet Absorption Spectra
- AHRENKIEL, R. K., "Modified Kramers-Kronig analysis of optical spectra", *J. Opt. Soc. Amer.* 61, N 12, 1651-1655 (1971) (Eng) (P.A. 75: 1678).
- ALEKSANDROV, A. P. and BREDIKHIN, V. I., "Measurement of the absolute value of the cross-section for two-photon absorption in anthracene molecules", *Opt. and Spektrosk.* 30, N 1, 72-74 (1971) (Russ) (P.A. 74: 57903).
- ALEKSANDROV, A. P., BREDIKHIN, V. I. and GENKIN, V. N., "Two-photon absorption by centrally symmetric organic molecules", *Zh. Eksp. Teor. Fiz.* 60, N 6, 2001-2010 (1971) (Russ) (P.A. 74: 55014).
- AMMA, R. A., SINGH, S. N. and NAIR, K. P. R., "Electronic spectrum of *m*-chlorotoluene in vapour phase", *Indian J. Pure Appl. Phys.* 9, N 5, 330-332 (1971) (Eng) (P.A. 74: 63335).
- ANGUS, J. G. and MORRIS, G. C., "The lowest free molecule Rydberg transition of naphthalene", *Aust. J. Chem.* 24, N 1, 173-177 (1971) (Eng).
- ANGUS, J. G. and MORRIS, G. C., "Naphthalene-rare gas solids: absorption spectra from 30000-80000 cm^{-1} ", *Mol. Cryst. and Liq. Cryst.* 11, N 3, 257-277 (1970) (Eng) (P.A. 74: 13466).
- ASTIER, R. and MEYER, Y. H., "Weak triplet-triplet absorption bands of naphthalene", *Chem. Phys. Letters* 11, N 4, 523-525 (1971) (Eng).
- ATKINSON, G. H. and PARMENTER, C. S., "The absorption spectrum of benzene vapor near 2537 Å", *J. Phys. Chem.* 75, N 10, 1564-1572 (1971) (Eng) (P.A. 74: 57906).
- ATKINSON, G. H. and PARMENTER, C. S., "On the $B_{2u} - A_{1g}$ absorption spectrum of benzene", In: 25th symposium on molecular structure and spectroscopy (abstracts), Columbus, Ohio, USA, 8-12 Sep 1970, Columbus, Ohio, USA: Ohio State Univ., 86 (1970) (Eng) (P.A. 74: 18232).
- BAHR, J. L., BLAKE, A. J., CARVER, J. H., GARDNER, J. L. and KUMAR, V., "Photoelectron spectroscopy and the molecular constants of autoionizing states", In: 8th Australian spectroscopy conference. Abstracts, Clayton, Australia, 16-20 Aug 1971. Clayton, Australia: Monash University, J2 (1971) (P.A. 75: 8565).
- BREE, A. and VILKOS, V. V. B., "A study of some singlet and triplet electronic states of pyrene", *Spectrochim. Acta* 27A, N 11, 2333-2354 (1971) (Eng).
- CAMINATI, W. and MIRRI, A. M., "Quadrupole hyperfine structure in the rotational spectrum of bromo- and chlorobenzene", *Chem. Phys. Letters* 12, N 1, 127-130 (1971) (Eng).
- DEPERASINSKA, I. and KWIATKOWSKI, J. S., "Electronic absorption spectra of some phthalic anhydride derivatives", *Bull. Acad. Polon. Sci., Ser. Math., Astron. Phys.* 19, N 7, 655-658 (1971) (Eng).
- GALLIVAN, J. B. and BRINEN, J. S., "Polarization of electronic transitions of aromatic hydrocarbons", In: *Molecular luminescence. An international conference*. New York-Amsterdam 93-110 (1969) (Eng).
- GERRITSEN, J. and MACLEAN, C., "NMR spectra of 1,2-difluorobenzene in nematic solvents. Anisotropy of indirect fluorine couplings and molecular geometry", *Spectrochim. Acta* 27A, N 8, 1495-1503 (1971) (Eng).
- GILBERT, R. and SANDORFFY, C., "The vacuum-ultraviolet spectrum of fluorobenzene", *Chem. Phys. Letters* 9, N 2, 121-124 (1971) (Eng) (P.A. 74: 35815).
- GREBENSHCHIKOV, D. M., KOVRIZHNYKH, N. A. and PERSONOV, R. I., "Width and relative intensity of luminescent lines and diffraz bands in case of aromatic compounds in *n*-paraffins at 77°K", *Opt. and Spektrosk.* 30, N 1, 63-68 (1971) (Russ).
- HOCHSTRASSER, R. M. and MARZACCO, C. A., "Electronic spectra of molecules with nearby electronic states", In: *Molecular luminescence. An international conference*. New York-Amsterdam 631-656 (1969) (Eng).
- HSIEH, J. C., LAOR, U. and LUDWIG, P. K., "Consideration of the absorption characteristics of organic vapors in interpretation of the decay properties of excited vibronic states: naphthalene", *Chem. Phys. Letters* 10, N 4, 412-417 (1971) (Eng).
- HURON, M.-J. and CLAVERIE, P., "Study of solute-solvent interactions", *Chem. Phys. Letters* 9, N 3, 194-198 (1971) (Eng).
- KALDOR, A., "Absorption spectrum of borazine in the vacuum ultraviolet", *J. Chem. Phys.* 55, N 9, 4641-4643 (1971) (Eng).
- KATZ, B., BRITH, M., SHARP, B. and JORTNER, J., "Electronic spectra of some methyl substituted benzenes in a rare-gas solid", *J. Chem. Phys.* 54, N 9, 3924-3934 (1971) (Eng) (P.A. 74: 35844).
- KHODYAKOVA, L. P. and SHEREMET'EV, G. D., "The effect of dye molecule carbon composition upon spectra of absorption and fluorescence of frozen *n*-paraffin solutions of perylene", *Zh. Prikl. Spektrosk.* 14, N 1, 103-105 (1971) (Russ) (P.A. 74: 37632).
- KIMOVA, L. A., OGLOBINA, A. I. and GLYADKOVSKII, V. I., "Study of the relationship between the sharpness of the spectra of aromatic hydrocarbons and their concentration in frozen *n*-paraffin solutions", *Opt. and Spektrosk.* 30, N 4, 707-713 (1971) (Russ) (P.A. 75: 1714).

- KOPTYUG, V. A. and GRIBOV, L. A., "Application of electronic computers to molecular spectroscopy", *Zh. Prikl. Spektrosk.* **15**, N 6, 1128 (Russ).
- KUHLMANN, K. F. and GRANT, D. M., "Carbon-13 relaxation and internal rotation in mesitylene and o-xylene", *J. Chem. Phys.* **55**, N 6, 2998-3007 (1971) (Eng).
- KWIATKOWSKI, J. S., "Electronic structure and spectra of organic molecules. Part XIII. Electronic spectra of protonated derivatives of pyridines and pyrimidines", *Acta Phys. Polon.* **A39**, N 6, 695-701 (1971) (Eng).
- LOPEZ-DELGADO, R., "Electronic spectra of benzene solid solutions. I. Matrix", In: Theses Doct. sci. phys. Fac. sci. Orsay Univ. Paris (1969) (Fr).
- LOPEZ-DELGADO, R., "Electronic spectra of benzene solid solutions. II. Solute", In: Theses Doct. sci. phys. Fac. sci. Orsay Univ. Paris (1969) (Fr).
- MCCLAINE, W. M., "Excited state symmetry assignment through polarized two-photon absorption studies of fluids", *J. Chem. Phys.* **55**, N 6, 2789-2796 (1971) (Eng).
- MEISTER, T. G. and NEMANOV, V. M., "Separation of the contributions from universal intermolecular interactions and from intermolecular hydrogen bonds to the observed shifts of electronic bands. II. The $n-\pi$ transition of some aliphatic ketones", *Opt. and Spektrosk.* **30**, N 4, 684-692 (1971) (Russ) (P.A. 75: 3104).
- MEL'NIK, V. I., PUCHKOVSKAYA, G. A., KHARCHENKO, N. P. and SHPAK, M. T., "Effect of ultraviolet irradiation on electronic and vibration spectra of benzophenone", *Optics and Spectrosc.*, **31**, N 2, 190-194 (1971) (Russ).
- MISHRA, P. C. and RAI, D. K., "Electronic structure and spectra of some hetero substituted benzenes", *Indian J. Pure Appl. Phys.* **8**, N 11, 691-693 (1970) (Eng) (P.A. 74: 30172).
- MISHRA, P. C., THAKUR, S. N. and RAI, D. K., "Ultraviolet spectra and structure of the isomeric fluoro- and chloro-toluenes", *J. Mol. Structure* **8**, N 3, 319-323 (1971) (Eng).
- MORRIS, G. C. and ANGUS, J. G., "Do antiresonances in benzene-rare-gas solids exist?", *J. Chem. Phys.* **54**, N 7, 3232-3234 (1971) (Eng) (P.A. 74: 41574).
- POPOV, K. R., SMIRNOV, L. V., NAKHIMOVSKAYA, L. A. and GREBNEVA, V. L., "Electronic and vibration states of molecules with biphenyl bases. I. Polarization of electronic transition", *Optics and Spectrosc.* **31**, N 3, 363-367 (1971) (Russ).
- POPOV, K. R. and SMIRNOV, L. V., "Polarization of electronic transitions in stilbene and azobenzene molecules", *Opt. and Spektrosk.* **30**, N 1, 178-179 (1971) (Russ) (P.A. 74: 57950).
- RHODES, W., "The nature of molecular excited states produced by weak light sources", *Chem. Phys. Letters* **11**, N 2, 179-183 (1971) (Eng).
- SHANTAROVICH, V. P., PETERSEN, K. and GOLDANSKII, V. I., "Carbonium ion and positronium quenching by diamagnetic organic molecules", *Chem. Phys. Letters* **11**, N 4, 464-465 (1971) (Eng).
- SHAPIO, R. G. and WILLIAMS, D. R., "Exchange contributions to the internal rotation barrier of o-xylene", *Mol. Phys.* **22**, N 2, 301-312 (1971) (Eng) (P.A. 75: 859).
- SHASHIDHAR, M. A., "Electronic absorption spectra of some monosubstituted benzenes in the vapour phase", *Spectrochim. Acta* **27A**, N 11, 2363-2374 (1971) (Eng).
- SMITH, D. R. and RAYMOND, J. W., "Rydberg states in fluorinated benzenes; hexa-, penta-, and monofluorobenzene", *Chem. Phys. Letters* **12**, N 2, 269-276 (1971) (Eng).
- STEPANOV, B. I. and KAZACHENKO, L. P., "Influence of solvent upon universal relationship between absorption and emission spectra", *Zh. Prikl. Spektrosk.* **14**, N 5, 819-825 (1971) (Russ).
- TISHCHENKO, V. G. and FETISOVA, M. M., "Electronic spectra of some carbonyl-containing compounds of the benzene series", *Opt. and Spektrosk.* **30**, N 1, 23-26 (1971) (Russ) (P.A. 74: 61057).
- TRIPATHI, R. S. and PANDEY, B. R., "Near ultraviolet absorption spectrum of chlorobenzene-D₂", *Indian J. Pure Appl. Phys.* **9**, N 6, 383-384 (1971) (Eng) (P.A. 75: 3075).
- UDAGAWA, Y., ITO, M. and NAGAKURA, S., "Rotational analysis of the 2714 Å band of p-difluorobenzene", *J. Mol. Spectrosc.* **36**, N 3, 541-550 (1970) (Eng) (P.A. 74: 25513).
- UTKINA, L. I. and FENINA, N. A., "Spectroscopy of methyl derivatives of 3,4-benzphenanthrene at 77 and 4.2°K", *Optics and Spectrosc.* **30**, N 2, 269-274 (1971) (Russ).
- UZHINOV, B. M., "The dipole moments and polarizabilities of singlet excited states of phenanthrene", *Spectrochim. Acta* **26A**, N 12, 2381-2382 (1970) (Eng).
- WU, C. Y. and LOMBARDI, J. R., "Dipole moment in the lowest ¹B₂ state of chlorobenzene", *J. Chem. Phys.* **55**, N 4, 1997-1998 (1971) (Eng) (P.A. 74: 68336).
- YANSON, I. K. and BOGATINA, N. I., "Investigation of tunnel spectra of impurity molecules in Sn-Sn and Pb-Pb junctions", *Zh. Eksp. Teor. Fiz.* **59**, N 5, 1509-1512 (1970) (Russ).
- ZALDI, Z. H. and KHANNA, B. N., "Spectroscopic study of naphthalene cation trapped in boric acid glass", *Indian J. Pure Appl. Phys.* **9**, N 1, 44-46 (1971) (Eng) (P.A. 74: 41577).

3.3. Triplet Absorption Spectra and ESR Spectra

- ALFIMOV, M. V., BATEKHA, I. G., SHECK, Yu. B. and GERKO, V. I., "Triplet-triplet absorption and energy transfer from high triplet states", *Spectrochim. Acta* **27A**, N 2, 329-341 (1971) (Eng).
- ASTIER, R. and MEYER, Y. H., "Weak triplet-triplet absorption bands of naphthalene", *Chem. Phys. Letters* **11**, N 4, 523-525 (1971) (Eng).
- BATLEY, M. and BRAMLEY, R., "Effect of higher excited states on triplet state e.p.r.", In: 8th Australian spectroscopy conference. Abstracts, Clayton, Australia, 16-20 Aug 1971. Clayton, Australia: Monash University (1971) (P.A. 75: 8762).
- BENARD, M. and JULG, A., "Theoretical study of triplet-triplet absorption in hydrocarbons", *J. Chim. Phys. phys.-chim. biol.* **67**, N 7-8, 1297-1311 (1970) (Fr) (P.A. 74: 8255).
- BENSASSON, R. and LAND, E. J., "Triplet-triplet extinction coefficients via energy transfer", *Trans. Faraday Soc.* **67**, N 583, 1904-1916 (1971) (Eng).
- BREE, A. and VILKOS, V. V. B., "A study of some singlet and triplet electronic states of pyrene", *Spectrochim. Acta* **27A**, N 11, 2333-2354 (1971) (Eng).
- BRINEN, J. S., "Quantitative ESR studies of organic triplet states. Extinction coefficients of T→T' transitions", In: *Molecular luminescence. An international conference*. New York-Amsterdam 333-349 (1969) (Eng).
- CLARKE, R. H., "Magnetic resonance studies of the deuteration effect on intersystem crossing in the anthracene molecule", *Chem. Phys. Letters* **12**, N 1, 157-160 (1971) (Eng) (P.A. 75: 12208).
- EL-SAYED, M. A., "Optical pumping of the lowest triplet state multiple resonance optical techniques in zero field", *J. Chem. Phys.* **54**, N 2, 680-691 (1971) (Eng).

- FORMAN, A. and KWIRAM, A. L., "Optical detection of magnetic resonance in randomly oriented triplet state molecules", In: *Molecular luminescence. An international conference*. New York-Amsterdam 321-331 (1969) (Eng).
- FOX, R. B., PRICE, T. R. and COZZENS, R. F., "Photophysical processes in polymers. III. Properties of triplet energy traps in 1-vinylnaphthalene copolymers", *J. Chem. Phys.* 54, N 1, 79-84 (1971) (Eng).
- FREED, J. H., BRUNO, G. V. and POLNASZEK, C., "ESR line shapes for triplets undergoing slow rotational reorientation", *J. Chem. Phys.* 55, N 11, 5270-5281 (1971) (Eng).
- GELIUS, U., ALLAN, C. J., JOHANSSON, G., SIEGBAHN, H., ALLISON, D. A. and SIEGBAHN, K., "The ESCA spectra of benzene and the iso-electronic series, thiophene, pyrrole and furan", *Phys. Scripta* 3, N 5, 237-242 (1971) (Eng) (P.A. 75: 5960).
- GIACHINO, G. G. and KEARNS, D. R., "External heavy atom perturbation of vibronic transitions in singlet-triplet spectra", *J. Chem. Phys.* 53, N 10, 3886-3891 (1970) (Eng).
- JAPAR, S. M. and RAMSAY, D. A., "Search for triplet-singlet absorption bands of pyridine", In: 25th symposium on molecular structure and spectroscopy (abstracts), Columbus, Ohio, USA, 8-12 Sep 1970. Columbus, Ohio, USA: Ohio State Univ. 85 (1970) (Eng) (P.A. 74: 8288).
- KNYAZHANSKII, M. I. and STRYKOV, M. B., "Determination of the dipole moments of organic molecules in the triplet excited state", *Opt. and Spektrosk.* 29, N 3, 469-472 (1970) (Russ) (P.A. 74: 32656).
- KOYANAGI, M. and GOODMAN, L., "Triplet state of benzaldehyde", *J. Chem. Phys.* 55, N 6, 2959-2976 (1971) (Eng).
- KUBALL, H.-G., KLETT, R. and EITING, W., "The anisotropy of the optical polarizability of naphthalene- η_8 in its lowest triplet state (photoselection method)", *Chem. Phys. Letters* 11, N 4, 454-457 (1971) (Eng).
- LANGELAAR, J., WEGDAM-VAN BEEK, J., TEN BRINK, H. and VAN VOORST, J. D. W., "The location, polarization and assignment of low lying excited triplet states in pyrene", *Chem. Phys. Letters* 7, N 3, 368-370 (1970) (Eng).
- LAVALLETTE, D., BENSASSON, R., AMAND, B. and LAND, E. J., "On the experimental determination of triplet-triplet extinction coefficients and oscillator strengths", *Chem. Phys. Letters* 10, N 3, 331-333 (1971) (Eng).
- LISOVSAYA, I. A. and ALPIMOV, M. V., "Mechanism of triplet molecules formation in solid solutions due to X-ray excitation", *Optics and Spectrosc.* 31, N 2, 200-204 (1971) (Russ).
- LIVAK, D. T. and INNES, K. K., "A triplet-singlet transition of s-tetrazine", *J. Mol. Spectrosc.* 39, N 1, 115-122 (1971) (Eng) (P.A. 74: 61091).
- MARSH, G., KEARNS, D. R. and SCHAFFNER, K., "Investigation of singlet-triplet transitions by phosphorescence excitation spectroscopy. IX. Conjugated enones", *J. Amer. Chem. Soc.* 93, N 13, 3129-3137 (1971) (Eng).
- MUSER, J. I., "Selection rules for matrix elements of spin-dependent operators", *Chem. Phys. Letters* 11, N 2, 153-156 (1971) (Eng).
- OWEN, G. S. and VINCOV, G., "Computer simulation of the ESR spectra of the naphthalene, anthracene, and perylene radical cations in a polycrystalline medium", *J. Chem. Phys.* 54, N 1, 368-375 (1971) (Eng).
- PAYLOPOULOS, T. G., "Search for the first $^3A_{1g} \leftarrow ^2B_{2u}$ transition in naphthalene", *J. Chem. Phys.* 53, N 11, 4230-4233 (1970) (Eng) (P.A. 74: 8274).
- ROBERTS, J. P. and DIXON, R. S., "The second triplet level of 1,5-dichloroanthracene in fluid solutions", *J. Phys. Chem.* 75, N 6, 845-848 (1971) (Eng).
- SHARNOFF, M., "Microwave-optical double quantum studies of short-lived triplet systems", *Symp. Faraday Soc.* N 3, 137-145 (1969) (Eng).
- SIEGEL, S. and STEWART, T., "Aromatic solute molecular ion and triplet state formation in polystyrene and polymethylmethacrylate", *J. Chem. Phys.* 55, N 4, 1775-1787 (1971) (Eng).
- SIXL, H. and SCHWÖBERER, M., "Optical electron-spin polarization of organic molecules in triplet states", *Z. Naturforsch.* 25a, N 10, 1383-1394 (1970) (Ger).
- VANDER DONCKT, E. and VOGELS, C., "Substituent effects on singlet-triplet absorption spectra. Use of organometallic compounds as enhancers of spin-forbidden transitions", *Spectrochim. Acta* 27A, N 10, 2157-2163 (1971) (Eng).
- WAGNER, P. J., "Reversible quenching of benzophenone photoreduction. The lifetime of triplet benzophenone in solution", *Mol. Photochem.* 1, N 1, 71-87 (1969) (Eng).

3.4. Electronic-vibrational Interaction and Vibronic Spectra

- BANDRAUK, A. D., "On unitarized Born approximations", *Chem. Phys. Letters* 12, N 2, 253-258 (1971) (Eng).
- GIACHINO, G. G. and KEARNS, D. R., "External heavy atom perturbation of vibronic transitions in singlet-triplet spectra", *J. Chem. Phys.* 53, N 10, 3886-3891 (1970) (Eng).
- HUNTER, J. L., NICHOLS, W. H. and HAUS, J., "Dispersion and absorption in C_6H_6 ", *Phys. Letters* 37A, N 2, 127-128 (1971) (Eng).
- KISELEV, A. A. and PETELIN, A. N., "The Born-Oppenheimer method for linear molecules", *Vestn. Leningr. Univ. Fiz. Khim.* N 22, 14-21 (1970) (Russ).
- KLOCHKOV, V. P. and BOGDANOV, V. L., "Study of the intensity distribution in the vibronic spectra of polyatomic molecules", *Opt. and Spektrosk.* 29, N 5, 862-867 (1970) (Russ) (P.A. 74: 51464).
- KNIGHT, A. E. and SELINGER, B. K., "Single vibronic level lifetimes", In: 8th Australian spectroscopy conference. Abstracts, Clayton, Australia, 16-20 Aug 1971. Clayton, Australia: Monash University, M2 (1971) (P.A. 75: 8736).
- KOCHERLAP, V. A., "On using molecular electron-vibrational phototransitions in lasers with heat pumping", *Ukr. Fiz. Zh.* 16, N 3, 396-402 (1971) (Russ).
- LAOR, U. and LUDWIG, P. K., "Fluorescence lifetimes of vibronic states of naphthalene vapor in the region of excitation from 3080-2150 Å", *J. Chem. Phys.* 54, N 3, 1054-1057 (1971) (Eng) (P.A. 74: 27923).
- LI, Y.-A., "Vibronic interaction and luminescence of organic molecules", In: Illinois Inst. Technol., Chicago, USA, thesis, 1970, 83 pp. Available from Univ. Microfilms, Ann Arbor, Mich., USA Order No. 70-20678 (Eng) (P.A. 74: 43996).
- MOOMAW, W. R. and SKINNER, J. F., "Vibronic spectra and energy levels of polyatomic molecules. A physical chemistry experiment", *J. Chem. Educ.* 48, N 5, 304-309 (1971) (P.A. 74: 56675).

- NAKHIMOVSKAYA, L. A., USTYUGOVA, L. N. and PROSKURYAKOVA, N. S., "Manifestation of intermolecular and intramolecular vibron interactions in spectra of quick-frozen hexane solution of phenanthrene", *Ukr. Fiz. Zh.* 16, N 2, 268-275 (1971) (Russ) (P.A. 74: 27925).
- NITZAN, A., JORTNER, J. and RENTZEPIS, P. M., "Peculiarities of the non-radiative decay of a single vibronic level in polyatomic molecules", *Chem. Phys. Letters* 8, N 5, 445-447 (1971) (Eng) (P.A. 74: 30173).
- ORLANDI, G. and SIEBRAND, W., "Vibronic coupling and line broadening in polyatomic molecules", *Chem. Phys. Letters* 8, N 6, 473-476 (1971) (Eng).
- PARMENTER, C. S. and SCHUYLER, M. W., "Single vibronic level fluorescence in benzene", In: 25th symposium on molecular structure and spectroscopy (abstracts), Columbus, Ohio, USA, 8-12 Sep 1970. Columbus, Ohio, USA: Ohio State Univ. 86 (1970) (Eng) (P.A. 74: 8236).
- PERSONOV, R. I., GODYAEV, E. D. and KOROTAEV, O. N., "On the line shape in luminescence quasi-linear spectra of organic molecules at 4.2°K", *Fiz. Tverd. Tela* 13, N 11, 111-116 (1971) (Russ).
- PERSONOV, R. I. and BYKHOVSKAYA, L. A., "On polarization of multiplet components in Shpol'skii's spectra", *Dokl. Akad. Nauk SSSR* 199, N 2, 299-302 (1971) (Russ).
- PERSONOV, R. I., OSAD'KO, I. S., GODYAEV, E. D. and AL'SHITS, E. I., "Study of phonon wings and phonon-free lines in spectra of *n*-paraffin impurity crystals", *Fiz. Tverd. Tela* 13, N 9, 2653-2663 (1971) (Russ) (P.A. 75: 1715).
- PETRASHEN', A. G. and REBANE, T. K., "On the construction of symmetry coordinates and the symmetry orbitals in the theory of the electronic and vibrational spectra of molecules", *Vestn. Leningr. Univ. Fiz. Khim.* N 22, 34-37 (1970) (Russ).
- PRIVUTOV, M. V. and KOVNER, M. A., "Calculation of relative intensities for vibration-structure lines of the ${}^1A_{1g} - {}^1B_{2u}$ band in absorption spectrum of benzene", *Optics and Spectrosc.* 31, N 5, 699-705 (1971) (Russ).
- REBANE, L. A., "Phonon wing structure in spectra of O_2^- and S_2^- molecular ions in KI crystals", *Optics and Spectrosc.* 31, N 2, 230-233 (1971) (Russ).
- SAPOZHNIKOV, M. N., "Thermal broadening and shift of phonon-free lines in quasi-linear spectra of impurity organic crystals", *Fiz. Tverd. Tela* 13, N 9, 2527-2534 (1971) (Russ).
- SATTEN, R. A., "Vibronic splitting and Zeeman effect in octahedral molecules: odd-electron systems", *Phys. Rev. A3*, N 4, 1246-1253 (1971) (Eng).
- SCHLAG, E. W., SCHNEIDER, S. and CHANDLER, D. W., "Fluorescence lifetimes of vibronic levels of naphthalene vapour", *Chem. Phys. Letters* 11, N 4, 474-477 (1971) (Eng).
- SCHUTTE, C. J. H., "The adiabatic Born-Oppenheimer approximation", *Quart. Rev.* 25, N 3, 393-405 (1971) (Eng).
- SHARF, B. and HONIG, B., "Comments on vibronic intensity borrowing", *Chem. Phys. Letters* 7, N 1, 132-136 (1970) (Eng).
- SIEBRAND, W., "Calculation of Franck-Condon factors for radiationless transitions based on selective excitation of single vibronic levels", *J. Chem. Phys.* 54, N 1, 363-367 (1971) (Eng).
- SPEARS, K. G. and RICE, S. A., "Study of the lifetimes of individual vibronic states of the isolated benzene molecule", *J. Chem. Phys.* 55, N 12, 5561-5581 (1971) (Eng).
- VAN DER WAALS, J. H., BERGHUIS, A. M. D. and DE GROOT, M. S., "Vibronic interaction in the lower electronic states of benzene. II. The hexagonal approximation for the free molecule and effect of a crystal field", *Mol. Phys.* 21, N 3, 497-521 (1971) (Eng) (P.A. 74: 57910).
- VATBEL, G. and BAESSLER, H., "Franck-Condon factors in intermolecular intersystem crossing", *Chem. Phys. Letters* 11, N 5, 613-616 (1971) (Eng) (P.A. 75: 10431).
- ### 3.5. Vibrational Spectra
- BAPAT, R. N., "The Raman spectrum of cyclohexyl benzene", *Indian J. Phys.* 44, N 5, 273-277 (1970) (Eng).
- ELYASHBERG, M. Ye., MOSKOVINA, L. A. and GRIBOV, L. A., "On application of mathematic logic to establishment of complex molecule structure by vibrational spectra", *Zh. Prikl. Spektrosk.* 15, N 5, 843-853 (1971) (Russ).
- FAVROT, J. and LEBAS, J. M., "Vibrational study of 1,3,5-methyl substituted benzene", *J. Chim. Phys. phys.-chim. biol.* 67, N 10, 1705-14 (1970) (Fr).
- GUSSONI, M. and DELLEPIANE, G., "On the evaluation of cartesian symmetry coordinates in molecular vibrations", *Chem. Phys. Letters* 10, N 5, 559-560 (1971) (Eng).
- HULER, E., SILBERMAN, E. and JONES, E. A., "The vibrations of borazine derivatives. II. A force field for borazine", *Spectrochim. Acta* 26A, N 12, 2241-2246 (1970) (Eng).
- HUNTER, J. L., NICHOLS, W. H. and HAUS, J., "Dispersion and absorption in C_6H_6 ", *Phys. Letters* 37A, N 2, 127-128 (1971) (Eng).
- JULIEN-LAFERRIERE, S. and LEBAS, J.-M., "Vibrational spectra of para-xylene and deuterated para-xylenes: problem of the methyl group conformation", *Spectrochim. Acta* 27A, N 8, 1337-1350 (1971) (Fr) (P.A. 74: 57954).
- KYDD, R. A., "Torsional force constants and the benzene out-of-plane force field", *Spectrochim. Acta* 27A, N 10, 2067-2072 (1971) (Eng).
- LA LAU, C. and SNYDER, R. G., "A valence force field for alkyl benzenes toluene, *p*-xylene, *m*-xylene, mesitylene, and some of their deuterated analogues", *Spectrochim. Acta* 27A, N 10, 2073-2088 (1971) (Eng).
- LUTOSHKIN, V. I., GOLOVKO, V. F., DYADYUSHA, G. G. and KRUGLYAK, Yu. A., "Calculation of equilibrium configuration and force field of antiracene, pyrene and coronene", *Teor. Eksp. Khim.* 7, N 5, 670-674 (1971) (Russ).
- MOROZOV, V. P. and ROSSIKHIN, V. V., "On nonempirical force constants of small molecules", *Usp. Khim.* 40, N 2, 349-307 (1971) (Russ).
- MURCHISON, C. B. and OVEREND, J., "CICN: vibrational anharmonicity and the treatment of Fermi resonance", *Spectrochim. Acta* 27A, N 11, 2407-2423 (1971) (Eng).
- NARIE, L. A., STEIN, P. and PETICOLA, W. L., "Time ordered diagrams for the resonant Raman effect from molecular vibrations", *Chem. Phys. Letters* 12, N 1, 131-136 (1971) (Eng).
- SEREGUINA, V. I., "Investigation of vibrational and translational dispersion in benzene vapor", *Akust. Zh.* 16, N 3, 485-486 (1970) (Russ) (P.A. 74: 32664).
- SINGH, B., JAISWAL, R. M. P. and SINGH, R. D., "Vibrational spectra of α - and β -fluoronaphthalenes", *Indian J. Pure Appl. Phys.* 9, N 1, 30-33 (1971) (Eng) (P.A. 74: 39697).

- STROKACH, N. S., GASTILOVICH, E. A. and SHIGORIN, D. N., "Calculation of the planar vibrations of 9,10-anthraquinone and 9,10-anthraquinone- d_8 ", *Opt. and Spektrosk.* **30**, N 1, 43-47 (1971) (Russ) (P.A. 74: 57902).
- STROKACH, N. S., GASTILOVICH, E. A. and SHIGORIN, D. N., "Calculation of two-dimensional vibrations of 9,10-anthraquinone and 9,10-anthraquinone- d_8 . II", *Optics and Spectrosc.* **30**, N 3, 433-437 (1971) (Russ).
- VERMA, V. N. and KAMALESH SINGH, "Vibrational spectra of *o*- and *m*-methylstyrenes", *Indian J. Phys.* **44**, N 4, 205-207 (1970) (Eng) (P.A. 75: 3107).
- WILLIS, J. N., Jr., "Raman spectra of organic molecules in the vapour state", In: 25th symposium on molecular structure and spectroscopy (abstracts), Columbus, Ohio, USA, 8-12 Sep 1970. Columbus, Ohio, USA: Ohio State Univ. 77 (1970) (P.A. 74: 8219).
- ### 3.6. Fluorescence
- ARISTOV, A. V., BAKHSHIEV, V. A., KUZIN, V. A. and PITERSKAYA, I. V., "Effect of the orientational intermolecular relaxation on stimulated emission spectra of organoluminophores", *Optics and Spectrosc.* **30**, N 1, 143-147 (1971) (Russ).
- ATKINSON, G. H., PARMENTER, C. S. and SCHUYLER, M. W., "Single vibronic level fluorescence. IV. Its application to the analysis of resonance fluorescence from benzene excited by the 2537-Å mercury line", *J. Phys. Chem.* **75**, N 10, 1572-1584 (1971) (Eng) (P.A. 74: 57907).
- BABA, H., NAKAJIMA, A., AOI, M. and CHIHARA, K., "Fluorescence from the second excited singlet state and radiationless processes in pyrene vapor", *J. Chem. Phys.* **55**, N 5, 2433-2438 (1971) (Eng) (P.A. 74: 68378).
- BABENKO, S. D., BENDERSKII, V. A., GOL'DANSKII, V. I., LAVRUSHKO, A. G. and TYCHINSKII, V. P., "Annihilation of singlet excited states in anthracene solutions", *Chem. Phys. Letters* **8**, N 6, 598-600 (1971) (Eng).
- BABENKO, S. D. and BENDERSKII, V. A., "Fluorescence of pyrene solutions under intense excitation", *Optics and Spectrosc.* **31**, N 6, 895-898 (1971) (Russ).
- BERLMAN, I. B., "A study of the relationship between conformation and certain spectroscopic parameters of fluorescent aromatic compounds", In: Conference on scintillator and liquid scintillation counting, San Francisco, Calif., USA, 7-10 July 1970. San Francisco, Calif., USA: Univ. Calif., San Francisco (1970) (Eng) (P.A. 74: 8295).
- BIRKS, J. B. and MUNRO, I. H., "The fluorescence lifetimes of aromatic molecules", *Usp. Fiz. Nauk* **105**, N 2, 251-305 (1971) (Russ).
- BLONDEAU, J. M. and STOCKBURGER, M., "Resonance fluorescence and electronic relaxation in naphthalene vapor", *Chem. Phys. Letters* **8**, N 5, 436-438 (1971) (Eng) (P.A. 74: 30204).
- BOJARSKI, C., DUDKIEWICZ, J. and SIEPIETOWSKA, A., "Experimental verification of concentrational depolarization theory incorporating the layer model of luminescence centers", *Acta Phys. Polon.* **A40**, N 5, 643-653 (1971) (Eng).
- CHAKRABARTI, S. K. and WARE, W. R., "Nanosecond time-resolved emission spectroscopy of 1-anilino-8-naphthalene sulfonate", *J. Chem. Phys.* **55**, N 12, 5494-5498 (1971) (Eng).
- CHAKRABARTI, S. K., "The polarized emission spectra of substituted naphthalenes", *J. Mol. Structure* **7**, N 3-4, 455-469 (1971) (Eng) (P.A. 74: 64226).
- CHAKRABARTI, S. K., "The polarized fluorescence excitation spectra of aromatic hydrocarbons", *J. Mol. Spectrosc.* **37**, N 3, 571-574 (1971) (Eng) (P.A. 74: 35823).
- CARRINGTON, C. G., "On the classical model for resonance fluorescence", *J. Phys.* **B4**, N 9, 1222-1229 (1971) (Eng).
- DENISENKO, G. I. and LISOVENKO, V. A., "Fluorescence of anthracene and phenanthrene molecules adsorbed on zeolite NaY", *Zh. Prikl. Spektrosk.* **14**, N 4, 702-705 (1971) (Russ).
- DYADYUSHA, G. G., PRZHONSKAYA, O. V., TIKHONOV, Ye. A. and SHEAK, M. T., "Intense fluorescence from the second excited state of molecular solutions of organic dyes", *Zh. Eksp. Teor. Fiz. Pis'ma* **14**, N 5, 330-333 (1971) (Russ).
- GLADIKH, L. P. and KLIMOVA, L. A., "Effect of phase changes in crystalline cyclohexane on fluorescence spectra of 3,4-benzopyrene", *Optics and Spectrosc.* **31**, N 4, 596-598 (1971) (Russ).
- JABŁOŃSKI, A., "On the emission anisotropy of fluorescence emitted by acceptor molecules dissimilar to donor molecules in isotropic solutions", *Bull. Acad. Pol. Sci., Ser. Math. Astron. Phys.* **19**, N 2, 171-174 (1971) (Eng).
- JONES, P. F. and SIEGEL, S., "Quenching of the luminescence of naphthalene by oxygen and nitric oxide", In: Conference on scintillator and liquid scintillation counting, San Francisco, Calif., USA, 7-10 July. San Francisco, Calif., USA: Univ. Calif., San Francisco (1970) (P.A. 74: 8276).
- KIVACH, L. N., SARZHEVSKII, A. M. and KHOMICH, M. I., "Spectral dependence of fluorescence polarization of anthracene derivatives", *Zh. Prikl. Spektrosk.* **15**, N 3, 448-454 (1971) (Russ) (P.A. 75: 4487).
- KOST', M. V., YEREMENKO, A. M., PIONTKOVSKAYA, M. A. and NEIMARK, I. E., "Low temperature luminescence spectra of naphthalene adsorbed on crystalline and amorphous adsorbents", *Zh. Prikl. Spektrosk.* **14**, N 1, 106-110 (1971) (Russ).
- LAWSON, C., HIRAYAMA, F. and LIPSKY, S., "Emission of liquid benzene: comparison of 1849 Å and 2537 Å excitation", In: *Molecular luminescence. An international conference*. New York-Amsterdam 837-849 (1969) (Eng).
- LOEWENTHAL, E. and LEVINGER, E., "Delayed fluorescence in cyclohexane by mechanism of self-diffusion", *Bull. Israel Phys. Soc.* **41-42** (1971) (P.A. 75: 4501).
- LOGAN, L. M., BUDULS, I. and ROSS, I. G., "Pressure dependence of the fluorescence spectrum of benzene", In: *Molecular luminescence. An international conference*. New York-Amsterdam 53-62 (1969) (Eng).
- MAMEDOV, Kh. I., NASIBOV, I. K., NIYAZOVA, E. N. and KHALILOV, M. M., "Quasilinear spectra of luminescence of free radicals of dimethylnaphthalenes and xylenes in a *n*-paraffin matrix at low temperatures", *Zh. Prikl. Spektrosk.* **15**, N 1, 51-54 (1971) (Russ).
- MARIA, H. J., SRINIVASAN, B. N. and MUGLYNN, S. P., "The luminescence of salts of simple polyatomic acids", In: *Molecular luminescence. An international conference*. New York-Amsterdam 787-800 (1969) (Eng).
- MASETTI, F., MAZZUCATO, U. and GALIAZZO, G., "Heavy atom effect on the luminescence of phenanthrene", *J. Luminescence* **4**, N 1, 8-12 (1971) (Eng) (P.A. 74: 66129).
- McDONALD, R. J. and SELINGER, B. K., "The fluorescence of pyrene in frozen solutions", *Aust. J. Chem.* **24**, N 2, 249-255 (1971) (Eng).

- PARMENTER, C. S. and SCHUYLER, M. W., "Single vibronic level fluorescence in benzene", In: 25th symposium on molecular structure and spectroscopy (abstracts), Columbus, Ohio, USA, 8-12 Sep 1970. Columbus, Ohio, USA: Ohio State Univ. 86 (1970) (Eng) (P.A. 74: 8236).
- PERSONOV, R. I., GODYAEV, E. D. and KOROTAEV, O. N., "On the line shape in luminescence quasi-linear spectra of organic molecules at 4.2°K", *Fiz. Tverd. Tela* 13, N 11, 111-116 (1971) (Russ).
- POOLE, J. A. and DHINGRA, R. C., "Experimental investigations of compounds exhibiting anomalous emission", In: *Molecular luminescence. An international conference*. New York-Amsterdam 813-827 (1969) (Eng).
- RIECKHOFF, K. E. and VOIGT, E. M., "Luminescence of phthalocyanines. I", In: *Molecular luminescence. An international conference*. New York-Amsterdam 295-308 (1969) (Eng).
- SCHLAG, E. W., SCHNEIDER, S. and CHANDLER, D. W., "Fluorescence lifetimes of vibronic levels of naphthalene vapour", *Chem. Phys. Letters* 11, N 4, 474-477 (1971) (Eng).
- SEVCHENKO, A. N., BURÓV, L. I., VOROPAY, V. E. and SARZHEVSKIY, A. M., "On the problem of two-photon fluorescence polarization", *Dokl. Akad. Nauk SSSR* 200, N 2, 311-313 (1971) (Russ).
- SZUDY, J., "On the correlation form of the Jablonski pressure broadening theory", *Bull. Acad. Pol. Sci., Ser. Math. Astron., Phys.* 19, N 2, 153-157 (1971) (Eng).
- TOPP, M. R. and RENTZEPIS, P. M., "Picosecond stimulated emission in a fluorescent solution following two-photon absorption", *Phys. Rev. A* 3, N 1, 358-364 (1971) (Eng).
- UTKINA, L. F. and FENINA, N. A., "Spectroscopy of methyl derivatives of 3,4-benzophenanthrene at 77° and 4.2°K", *Optics and Spectrosc.* 30, N 2, 269-274 (1971) (Russ).
- VERDIECK, J. F. and JANKOWSKI, W. A., "Luminescence of corannulene", In: *Molecular luminescence. An international conference*. New York-Amsterdam 829-836 (1969) (Eng).
- VINCETT, P. S., VOIGT, E. M. and RIECKHOFF, K. E., "Phosphorescence and fluorescence of phthalocyanines", *J. Chem. Phys.* 55, N 8, 4131-4140 (1971) (Eng).
- WANNIER, P., RENTZEPIS, P. M. and JORTNER, J., "Resonance fluorescence from the second excited singlet state of naphthalene", *Chem. Phys. Letters* 10, N 2, 193-196 (1971) (Eng) (P.A. 74: 61077).
- ### 3.7. Phosphorescence
- EL-SAYED, M. A., "The intersystem crossing to and the phosphorescence from the individual sublevels of the lowest triplet state in pyrazine at 1.6°K", In: *Molecular luminescence. An international conference*. New York-Amsterdam 715-737 (1969) (Eng).
- EL-SAYED, M. A. and OLMSTED, J., "Intersystem crossing relative rates from pulsed-excitation phosphorescence microwave double resonance", *Chem. Phys. Letters* 11, N 5, 568-572 (1971) (Eng).
- FAVARO, G., MASSETTI, F. and MAZZUCATO, U., "Luminescence spectra and triplet lifetimes of neutral and protonated azaphenanthrenes", *Spectrochim. Acta* 27A, N 6, 915-921 (1971) (Eng) (P.A. 74: 49640).
- GRADYUSHKO, A. T., MASHENKOV, V. A. and SOLOV'EV, K. N., "The quasilinear phosphorescence, fluorescence and absorption spectra of metal complexes of tetraabenzoporphine", *Zh. Prikl. Spektrosk.* 15, N 2, 265-271 (1971) (Russ) (P.A. 75: 4486).
- JOHNSON, R. C., ERN, V., WILEY, D. W. and MERRIFIELD, R. E., "Oxygen quenching of delayed fluorescence in the solid state", *Chem. Phys. Letters* 11, N 2, 188-191 (1971) (Eng).
- KARYAKIN, A. V., ANIKINA, L. I. and CHIRKOVA, T. S., "Phosphorescent spectra of benzene homologues in frozen solvents", *Zh. Prikl. Spektrosk.* 15, N 3, 455-460 (1971) (Russ) (P.A. 75: 4502).
- KENT, J. E., O'DWYER, M. F. and STEPHENS, R. J., "Phosphorescence lifetimes of substituted benzenes", *Chem. Phys. Letters* 10, N 2, 201-203 (1971) (Eng).
- KILMER, N. G. and SPANGLER, J. D., "Temperature effects on the phosphorescence of benzene and toluene", *J. Chem. Phys.* 54, N 2, 604-611 (1971) (Eng) (P.A. 74: 16684).
- KILMER, N. G., "Temperature effects on the phosphorescence of benzene, toluene and pyrazine", In: *Kansas State Univ. Manhattan, USA, thesis*, 1970, 165 pp. Available from Univ. Microfilms, Ann Arbor, Mich., USA Order No. 71-11323 (P.A. 74: 80489).
- KOYANAGI, M., KOGO, Y. and KANDA, Y., "Phosphorescence from the two triplet states of *p*-benzoquinone and toluquinone vapour", *Mol. Phys.* 20, N 4, 747-750 (1971) (Eng) (P.A. 74: 23395).
- KUNTZ, E., CANADA, R., WAGNER, R. and AUGENSTEIN, L., "Phosphorescence from tyrosine and tryptophan in different microenvironments", In: *Molecular luminescence. An international conference*. New York-Amsterdam 551-567 (1969) (Eng).
- LAMOLA, A. A., "Reversible triplet energy transfer and thermally activated delayed phosphorescence", *J. Amer. Chem. Soc.* 92, N 17, 5045-5048 (1970) (Eng).
- LANGELAAR, J., RETTSCHNICK, R. P. H. and HOYTINK, G. J., "Studies of triplet radiative lifetimes, phosphorescence, and delayed fluorescence yields of aromatic hydrocarbons in liquid solutions", *J. Chem. Phys.* 54, N 1, 1-7 (1971) (Eng).
- LODHI, S. A. K., "Studies of triplet naphthalene quenching by peroxide", *Pakistan J. Sci. and Ind. Res.* 14, N 3, 173-176 (1971) (Eng).
- LONG, M. E., LI, Y. H. and LIM, E. C., "On the dual phosphorescence of aromatic carbonyl compounds", *Mol. Photochem.* 3, N 3, 221-229 (1971) (Eng).
- METZGER, J. Y. L. and MEYER, R., "Temperature dependence of phosphorescence intensity and lifetime", In: 25th symposium on molecular structure and spectroscopy (abstracts), Columbus, Ohio, USA, 8-12 Sep 1970. Columbus, Ohio, USA: Ohio State Univ. 44-45 (1970) (Eng) (P.A. 74: 9925).
- NISHIMURA, A. M., TINTI, D. S. and VINCENT, J. S., "Phosphorescence-microwave double-resonance studies of 1,3-, 1,5-, and 1,8-diazanaphthalene", *Chem. Phys. Letters* 12, N 2, 360-364 (1971) (Eng).
- OFFEN, H. W. and HEIN, D. E., "Effects of high pressures on the phosphorescence of aromatic hydrocarbons at 77°K", In: *Molecular luminescence. An international conference*. New York-Amsterdam 1-14 (1969) (Eng).
- PERKAMPUS, H.-H. and VOLLBRECHT, H.-R., "Phosphorescence of benzene derivatives", *Spectrochim. Acta* 27A, N 10, 2173-2189 (1971) (Ger) (P.A. 74: 78967).
- SAHAI, R., HOFELDT, R. H. and LIN, S. H., "The heavy atom effect on the phosphorescence of aromatic hydrocarbons. III. Quenching of perdeuterated benzene by alkali halides", *Trans. Faraday Soc.* 67, N 582, 1690-1697 (1971) (Eng) (P.A. 74: 80488).
- SCHANDRY, R. and VOITLANDER, J., "On the ferrocene phosphorescence", *Z. Naturforsch.* 26a, N 10, 1772-1773 (1971) (Ger).
- SEBTI, M., DUPUY, F., MEGEL, J. and NOUCHI, G., "Triplet to singlet emission spectrum of some methylated and chlorinated derivatives of *p*-benzoquinone in a solid solution at 77-deg.-K", *C. R. Acad. Sci., Paris* 272B, N 2, 123-126 (1971) (Fr).

- SIMPSON, J. and OFFEN, H., "Phosphorescence of benzophenone, benzophenone- d_{10} , and decafluorobenzophenone in rigid glasses and crystals under pressure", *J. Chem. Phys.* 55, N 10, 4832-4836 (1971) (Eng).
- TINTI, D. S. and EL-SAYED, M. A., "New techniques in triplet state phosphorescence spectroscopy: application to the emission of 2,3-dichloroquinoxaline", *J. Chem. Phys.* 54, N 6, 2529-2549 (1971) (Eng).
- VINGETT, P. S., VOIGT, E. M. and RIECKHOFF, K. E., "Phosphorescence and fluorescence of phthalocyanines", *J. Chem. Phys.* 55, N 8, 4131-4140 (1971) (Eng).
- WYRSCH, D. and LABHART, H., "Investigations of the triplet decay mechanisms of 1,2-benzanthracene in solution. I. Kinetics and quantum yields of delayed fluorescence", *Chem. Phys. Letters* 12, N 2, 373-377 (1971) (Eng).
- WYRSCH, D. and LABHART, H., "Magnetic field effects on p -type delayed fluorescence of 1,2-benzanthracene in solution", *Chem. Phys. Letters* 8, N 2, 217-219 (1971) (Eng).

3.8. Dissipation and Migration of Molecular Excitation Energy, Time Constants

- AGABEKYAN, A. S., "Resonance energy transfer in media with unhomogeneous broadening of spectral lines", In: Proceedings of the first All-Union seminar on energy transfer in condensed media. Lori, Armenia 6-12 Oct 1969, Erevan, 53-67 (1970) (Russ).
- AGABEKYAN, A. S. and MELIKYAN, A. O., "Study of radiationless energy transfer by method of density matrix", In: Proceedings of the first All-Union seminar on energy transfer in condensed media. Lori, Armenia 6-12 Oct 1969, Erevan 5-16 (1970) (Russ).
- AGABEKYAN, A. S., "Theory of energy resonant transfer with account of inhomogeneous broadening of spectral lines", *Optics and Spectrosc.* 30, N 3, 449-455 (1971) (Eng).
- AL-ANI, KH. and PHILLIPS, D., "Quenching of excited states of fluorobenzene in the gas phase", *J. Phys. Chem.* 75, N 24, 3662-3667 (1971) (Eng).
- ALFIMOV, M. V., BATEKHA, I. G., SHECK, YU. B. and GERKO, V. I., "Triplet-triplet absorption and energy transfer from high triplet states", *Spectrochim. Acta* 27A, N 2, 329-341 (1971) (Eng).
- ANTIPENKO, B. M. and ERMOLAEV, V. L., "Role of the solvent in the processes of radiationless energy transfer between rare-earth ions", *Optics and Spectrosc.* 30, N 1, 75-80 (1971) (Russ).
- BATEKHA, I. G., SHECK, YU. B., KRYSANOV, S. A. and ALFIMOV, M. V., "Energy transfer from higher triplet levels as a cause of polymer photodestruction", *Dokl. Akad. Nauk SSSR* 197, N 3, 614-617 (1971) (Russ).
- BATEKHA, I. G. and ALFIMOV, M. V., "Interaction between singlet excitations of toluene and triplet doped molecules at 77°K", *Optics and Spectrosc.* 30, N 5, 994-996 (1971) (Russ).
- BENSASSON, R. and LAND, E. J., "Triplet-triplet extinction coefficients via energy transfer", *Trans. Faraday Soc.* 67, N 583, 1904-1915 (1971) (Eng).
- BLONDEAU, J. M. and STOCKBURGER, M., "Resonance fluorescence and electronic relaxation in naphthalene vapor", *Chem. Phys. Letters* 8, N 5, 436-438 (1971) (Eng) (*P. A.* 74: 30204).
- BOJARSKI, C., DUDKIEWICZ, J. and SIEPETOWSKA, A., "Experimental verification of concentrational depolarization theory incorporating the layer model of luminescence centers", *Acta Phys. Polon.* A40, N 5, 643-653 (1971) (Eng).
- BORKMAN, R. F., "Deuterium effect on the phosphorescence lifetime of biacetyl crystal and vapor", *Chem. Phys. Letters* 9, N 1, 77-79 (1971) (Eng).
- BREWER, T., "Oxygen quenching of the aromatic excited singlet state", *J. Amer. Chem. Soc.* 93, N 3, 775-776 (1971) (Eng).
- BRINEN, J. S. and GERHARDT, G. E., "Energy transfer studies on bridged molecules containing p -terphenyl", In: Conference on scintillator and liquid scintillation counting, San Francisco, Calif., USA, 7-10 July 1970. San Francisco, Calif., USA: Univ. Calif., San Francisco (1970) (*P. A.* 74: 8296).
- BRINEN, J. S., "ESR and luminescence studies of intramolecular energy transfer", *Mol. Photochem.* 2, N 2, 121-131 (1970) (Eng).
- BUETTNER, A. V., SNAVELY, B. B. and PETERSON, O. G., "Triplet state quenching of stimulated emission from organic dye solutions", In: *Molecular luminescence. An international conference*. New York-Amsterdam 403-422 (1969) (Eng).
- BURDETT, J. K., "Electronic relaxation and molecular vibrations", *Appl. Spectrosc. Revs.* 4, N 1, 43-96 (1970) (Eng).
- BUSCH, G. E., RENTZEPIS, P. M. and JORTNER, J., "Long radiative decay times of the excited singlet state of the isolated benzophenone molecule", *Chem. Phys. Letters* 11, N 4, 437-440 (1971) (Eng).
- BYRNE, J. P. and ROSS, I. G., "Electronic relaxation as a cause of diffuseness in electronic spectra", *Aust. J. Chem.* 24, N 6, 1107-1141 (1971) (Eng).
- CHEN, T.-h. and SCHLAG, E. W., "Direct measurement of the lifetime of benzene in its vibrationless 1B_u state", In: *Molecular luminescence. An international conference*. New York-Amsterdam 381-392 (1969) (Eng).
- CHIU, Y.-N., "On the collisional transfer of rovibronic and translational energy between differently excited like molecules", *J. Chem. Phys.* 55, N 10, 5052-5062 (1971) (Eng).
- CRAVER, F. W., "Theory of concentration quenching of fluorescence polarization in two-dimensional solutions", *Mol. Phys.* 22, N 3, 403-420 (1971) (Eng).
- CRAVER, F. W. and KNOX, R. S., "Theory of polarization quenching by excitation transfer II. Anisotropy and second-neighbour considerations", *Mol. Phys.* 22, N 3, 385-402 (1971) (Eng).
- EL-BATOUMI, M. A., "Relaxation processes in excited molecular systems", In: 8th Australian spectroscopy conference. Abstracts. Clayton, Australia, 16-20 Aug 1971. Clayton, Australia: Monash University M3 (1971) (*P. A.* 75: 8520).
- EL-SAYED, M. A. and OLMSTED, J., "Intersystem crossing relative rates from pulsed-excitation phosphorescence microwave double resonance", *Chem. Phys. Letters* 11, N 5, 568-572 (1971) (Eng).
- ERMOLAEV, V. L. and SHAKHYERDOV, T. A., "Radiationless energy transfer from rare-earth ions to dyes in solid solutions", *Optics and Spectrosc.* 30, N 4, 648-654 (1971) (Russ).
- FAVARO, G., MASETTI, F. and MAZZUCATO, U., "Luminescence spectra and triplet lifetimes of neutral and protonated azaphenanthrenes", *Spectrochim. Acta* 27A, N 6, 915-921 (1971) (Eng) (*P. A.* 74: 49640).
- FISCHER, S., "Anharmonicity in the theory of nonradiative transitions for polyatomic molecules", *Chem. Phys. Letters* 11, N 5, 577-582 (1971) (Eng) (*P. A.* 75: 8504).

- FISCHER, S., SCHLAG, E. W. and SCHNEIDER, S., "Communicating states model for intersystems crossing of isolated molecules", *Chem. Phys. Letters* 11, N 5, 583-588 (1971) (Eng) (P.A. 75: 8505).
- FISCHER, S., "Franck-Condon factors and the method of steepest descent", *J. Chem. Phys.* 55, N 12, 5844 (1971) (Eng) (P.A. 75: 8507).
- FISCHER, S., "Pseudorotation and the environmental effects of the phosphorescence lifetime of benzene", *Chem. Phys. Letters* 10, N 4, 397-400 (1971) (Eng).
- FISCHER, S. and SCHNEIDER, S., "Where does the energy go for radiationless transitions? The $^3B_{1u} \rightarrow ^1A_{1g}$ transition for benzene and deuterobenzene", *Chem. Phys. Letters* 10, N 4, 392-396 (1971) (Eng) (P.A. 74: 72386).
- FÖRSTER, Th., "Excitation transfer and internal conversion", *Chem. Phys. Letters* 12, N 2, 422-424 (1971) (Eng).
- GELDOF, P. A., RETTSCHNICK, R. P. H. and HOYTINK, G. J., "Vibronic coupling and radiative transitions", *Chem. Phys. Letters* 10, N 5, 549-558 (1971) (Eng).
- GEORGHIOU, S. and NAQVI, K. R., "Solvent excitation migration in liquid scintillators: a theoretical study", In: *Molecular luminescence. An international conference*. New York-Amsterdam 393-401 (1969) (Eng).
- GERKO, V. I., SHECK, Yu. B., BATERHA, I. G. and ALFIMOV, M. V., "Efficiency of energy transfer from higher triplet levels", *Opt. and Spektrosk.* 30, N 3, 456-460 (1971) (Russ) (P.A. 74: 80476).
- GOLDSCHMIDT, C. R., POTASHNIK, R. and OTTOLENGHI, M., "Intersystem crossing in the charge-transfer quenching of molecular fluorescence", *J. Phys. Chem.* 75, N 8, 1025-1031 (1971) (Eng).
- GORSHKOV, V. K. and YASHIN, V. A., "Study of radiation and radiationless mechanisms of energy transfer between molecules in solutions", In: *Proceedings of the first All-Union seminar on energy transfer in condensed media*. Lori, Armenia 6-12 Oct 1969. Erevan, 149-154 (1970) (Russ).
- GRADYUSHKO, A. T. and TSVIRKO, M. P., "Probabilities for intercombination transitions in porphyrin and metalloporphyrin molecules", *Opt. and Spektrosk.* 31, N 4, 548-558 (1971) (Russ).
- GRANT, W. J. C., "Role of rate equations in the theory of luminescent energy transfer", *Phys. Rev.* B4, N 2, 648-663 (1971) (Eng) (P.A. 74: 53261).
- HALLAND, D. M. and NIEMAN, G. C., "Solvent effects on triplet lifetimes-benzene at low temperatures", In: 25th symposium on molecular structure and spectroscopy (abstracts), Columbus, Ohio, USA, 8-12 Sep 1970. Columbus, Ohio, USA: Ohio State Univ. 47 (1970) (Eng) (P.A. 74: 11862).
- HATCH, G. F., ERITZ, M. D. and NIEMAN, G. C., "Environmental effects on phosphorescent lifetimes", In: *Molecular luminescence. An international conference*. New York-Amsterdam 21-38 (1969) (Eng).
- HEDGES, R. M. and HOFER, O. C., "Theoretical calculations of singlet-singlet and triplet-triplet radiative lifetimes in aromatic hydrocarbons", In: *Conference on scintillator and liquid scintillation counting*, San Francisco, Calif., USA, 7-10 July 1970. San Francisco, Calif., USA: Univ. Calif., San Francisco (1970) (P.A. 74: 8216).
- HENRY, B. R., "Singlet-triplet nonradiative transitions in aromatic hydrocarbons", In: 25th symposium on molecular structure and spectroscopy (abstracts), Columbus, Ohio, USA, 8-12 Sep 1970. Columbus, Ohio, USA: Ohio State Univ. 40 (1970) (Eng) (P.A. 74: 8227).
- HENRY, B. R. and SIEBRAND, W., "Spin-orbit coupling in aromatic hydrocarbons. Analysis of non-radiative transitions between singlet and triplet states in benzene and naphthalene", *J. Chem. Phys.* 54, N 3, 1072-1085 (1971) (Eng) (P.A. 74: 30174).
- HENRY, B. R. and SIEBRAND, W., "Theoretical calculation of radiationless transition rates", In: *Molecular luminescence. An international conference*. New York-Amsterdam 423-436 (1969) (Eng).
- HENRY, B. R. and SIEBRAND, W., "Theory of electron spin alignment through nonradiative processes in naphthalene and anthracene", *Chem. Phys. Letters* 7, N 5, 533-536 (1970) (Eng) (P.A. 74: 8275).
- HEVESI, J., "Relative yield of luminescence of quenched viscous solutions", In: *Molecular luminescence. An international conference*. New York-Amsterdam 167-183 (1969) (Eng).
- HORROCKS, D. L., "Temperature and solvent effects on the fluorescence spectrum of 2,2'-binaphthyl", In: *Molecular luminescence. An international conference*. New York-Amsterdam 63-78 (1969) (Eng).
- HUDSON, J. A. and HEDGES, R. M., "Luminescence and intramolecular energy transfer in rigid model compounds", In: *Molecular luminescence. An international conference*. New York-Amsterdam 667-676 (1969) (Eng).
- JONES, P. F. and DIEGEL, S., "Quenching of naphthalene luminescence by oxygen and nitric oxide", *J. Chem. Phys.* 54, N 8, 3360-3366 (1971) (Eng) (P.A. 74: 34045).
- JONES, P. F. and CALLOWAY, A. R., "Temperature effects on the intramolecular decay of the lowest triplet state of benzophenone", *Chem. Phys. Letters* 10, N 4, 438-443 (1971) (Eng) (P.A. 74: 72389).
- JONES, P. F. and SIEGEL, S., "Temperature effects on the phosphorescence of aromatic hydrocarbons in plastics", In: *Molecular luminescence. An international conference*. New York-Amsterdam 15-19 (1969) (Eng).
- KEARNS, D. R. and STONE, A. J., "Excited-state intermolecular interactions involving paramagnetic molecules: effect of spin-spin and spin-orbit interactions on the quenching of triplets", *J. Chem. Phys.* 55, N 7, 3383-3389 (1971) (Eng).
- KEARVELL, A. and WILKINSON, F., "Internal conversion from the lowest excited singlet states of aromatic hydrocarbons", *Chem. Phys. Letters* 11, N 4, 472-473 (1971) (Eng) (P.A. 75: 3121).
- KELLER, R. A., "Intersystem crossing from excited triplet states into the singlet manifold", In: *Molecular luminescence. An international conference*. New York-Amsterdam 453-468 (1969) (Eng).
- KNIGHT, A. E. W. and SELINGER, B. K., "Deuterium isotope effect on the fluorescence lifetimes of azulene", *Chem. Phys. Letters* 12, N 2, 419-421 (1971) (Eng).
- KOZHUSHNER, M. A., "Theory of inductive resonance transfer of energy in a solid", *Fiz. Tverd. Tela* 13, N 9, 2601-2609 (1971) (Russ) (P.A. 75: 1677).
- KROPP, J. L. and DAWSON, W. R., "Fluorescence and phosphorescence of aromatic hydrocarbons in poly(methylmethacrylate) as a function of temperature", In: *Molecular luminescence. An international conference*. New York-Amsterdam 39-52 (1969) (Eng).
- KURTIN, W. E., MOORE, T. A. and SONG, P. S., "The nature of the flavin triplet and a model for biological quantum conversion", In: *Molecular luminescence. An international conference*. New York-Amsterdam 569-588 (1969) (Eng).
- KUSTOV, Ye. F. and SUROGUIN, L. I., "Excitation transfer with cross and longitudinal relaxations", In: *Proceedings of the first All-Union seminar on energy transfer in condensed media*. Lori, Armenia 6-12 Oct 1969. Erevan 17-25 (1970) (Russ).
- LAMOLA, A. A., "Reversible triplet energy transfer and thermally activated delayed phosphorescence", *J. Amer. Chem. Soc.* 92, N 17, 5045-5048 (1970) (Eng).

- LANGELAAR, J., RETTSCHNICK, R. P. H. and HOYTINK, G. J., "Studies of triplet radiative lifetimes, phosphorescence, and delayed fluorescence yields of aromatic hydrocarbons in liquid solutions", *J. Chem. Phys.* **54**, N 1, 1-7 (1971) (Eng).
- LEVINE, R. D., "Radiationless transitions population inversions: two examples of internal conversion", *Chem. Phys. Letters* **10**, N 5, 510-515 (1971) (Eng).
- LEWIS, F. D., DALTON, J. C. and TURRO, N. J., "Singlet energy transfer to *cis*- and *trans*-stilbene", *Mol. Photochem.* **2**, N 1, 67-71 (1970) (Eng).
- LIM, E. C. and BHATTACHARJEE, H. R., "'Inverse' deuterium isotope effect in radiationless electronic transitions. Singlet→triplet intersystem crossing in anthracene", *Chem. Phys. Letters* **9**, N 3, 249-250 (1971) (Eng).
- LIM, E. C. and BHATTACHARJEE, H. R., "Temperature dependence of deuterium isotope effect in fluorescence of aromatic hydrocarbons", *J. Chem. Phys.* **55**, N 10, 5126-5127 (1971) (Eng).
- LIM, E. C., "Vibronic interactions and radiationless transitions in heteroaromatic and aromatic carbonyl compounds: I. General considerations", In: *Molecular luminescence. An international conference*. New York-Amsterdam, 469-478 (1969) (Eng).
- LIM, E. C., KANDA, Y. and STANISLAUS, J., "Vibronic spin-orbit interactions in aromatic carbonyl compounds. I. On the assignment of the lowest triplet state in aromatic carbonyl compounds", In: *Molecular luminescence. An international conference*. New York-Amsterdam 111-118 (1969) (Eng).
- LIN, D. P. and KEVAN, L., "Paramagnetic relaxation study of spatial distribution of trapped electrons in gamma-irradiated organic glasses", *J. Chem. Phys.* **55**, N 6, 2629-2635 (1971) (Eng).
- LIN, K. C. and LIN, S. H., "Theoretical calculation of an external heavy-atom effect on the spin-orbit coupling of the benzene molecule", *Mol. Phys.* **21**, N 6, 1105-1122 (1971) (Eng) (P.A. 74: 75830).
- LIN, S. H., "Theory of delayed thermal fluorescence", *Theor. Chim. Acta* **23**, N 1, 98-102 (1971) (Eng).
- LINDER, B. and ABDULNUR, S., "Solvent effects on electronic spectral intensities", *J. Chem. Phys.* **54**, N 4, 1807-1814 (1971) (Eng).
- MAKSHANTSEV, B. I., "On the theory of radiationless electron transitions. I. Frank-Condon factor for Morse oscillator with small parameter", *Optics and Spectrosc.* **31**, N 3, 355-359 (1971) (Russ).
- MAKUSHENKO, A. M., NPORENT, B. S. and STOLBOVA, O. V., "Reversible orientational photodichroism and photoisomerization of complex organic compounds in viscous solutions", *Optics and Spectrosc.* **31**, N 5, 741-748 (1971) (Russ).
- MARTIN, T. E. and KALANTAR, A. H., "Nonradiative decay of benzene's lowest triplet state and CH anharmonicity", In: *Molecular luminescence. An international conference*. New York-Amsterdam 437-451 (1969) (Eng).
- METZGER, J. Y. L. and MEYER, B., "Temperature dependence of phosphorescence intensity and lifetime", In: 25th symposium on molecular structure and spectroscopy (abstracts), Columbus, Ohio, USA, 8-12 Sep 1970. Columbus, Ohio, USA: Ohio State Univ. 44-45 (1970) (Eng). (P.A. 74: 9925).
- MURAKAMI, Y., SHIMADA, R. and KANDA, Y., "Heavy-atom effect on the T-S transition of quinoxaline", In: *Molecular luminescence. An international conference*. New York-Amsterdam 119-134 (1969) (Eng).
- NAGIBAROVA, I. A. and SHEGEDA, A. M., "Nonresonance energy migration in solids", *Optics and Spectrosc.* **30**, N 1, 174-177 (1971) (Russ).
- NAGIBAROVA, I. A. and SHEGEDA, A. M., "Temperature dependence of non-resonance energy migration in solids", *Phys. Stat. Sol.(b)* **43**, N 2, 605-608 (1971) (Eng).
- NAKAMURA, K., "Radiationless processes in fluorobenzene", *J. Chem. Phys.* **54**, N 10, 4160-4164 (1971) (Eng) (P.A. 74: 44025).
- NIKITIN, E. E. and UMANSKII, S. J., "The effect of electron-vibronic interaction on vibrational relaxation of O₂ and N₂ in collisions with O atoms", *Dokl. Akad. Nauk SSSR* **196**, N 1, 145-148 (1971) (Russ).
- NITZAN, A., JORTNER, J. and RENTZEPIS, P. M., "Peculiarities of the non-radiative decay of a single vibronic level in polyatomic molecules", *Chem. Phys. Letters* **8**, N 5, 445-447 (1971) (Eng) (P.A. 74: 30173).
- NITZAN, A. and JORTNER, J., "What is the nature of intramolecular coupling responsible for internal conversion in large molecules?", *Chem. Phys. Letters* **11**, N 4, 458-463 (1971) (Eng).
- POTASHNIK, R., GOLDSCHMIDT, C. R. and OTTOLENGHI, M., "Triplet state formation in the quenching of fluorescence by molecular oxygen", *Chem. Phys. Letters* **9**, N 5, 424-425 (1971) (Eng).
- RABINOVITCH, B. S., CARROLL, H. F., RYNBRANDT, J. D., GEORGAKAKOS, J. H., THRUSH, B. A. and ATKINSON, R., "Vibrational deexcitation of highly excited polyatomic molecules. The amount of energy transferred per collision", *J. Phys. Chem.* **75**, N 21, 3376-3377 (1971) (Eng).
- REHM, D. and EISENTHAL, K. B., "Intermolecular energy transfer studied with picosecond light pulses", *Chem. Phys. Letters* **9**, N 5, 387-389 (1971) (Eng).
- RICE, S. A. and GELBART, W. M., "Relaxation phenomena in excited molecules", In: *Aspects of modern quantum chemistry*. (Aspects de la chimie quantique contemporaine). Menton 8-13 Juillet 1970. 15, Quai Anatole-France-Paris-Ville Centre National de la Recherche Scientifique, 165-205 (1971) (Eng).
- RICHARDS, J. L. and RICE, S. A., "Radiationless processes in aromatic molecules studied in Shpol'skii matrices", *Chem. Phys. Letters* **9**, N 5, 444-450 (1971) (Eng) (P.A. 74: 47675).
- RICHARDS, J. L. and RICE, S. A., "Study of impurity-host coupling in Shpol'skii matrices", *J. Chem. Phys.* **54**, N 5, 2014-2023 (1971) (Eng) (P.A. 74: 30171).
- SAFARYAN, F. P. and KRAUSHINSKIY, L. L., "Dynamic redistribution of vibrational energy store on degrees of freedom of polyatomic system", In: Proceedings of the first All-Union seminar on energy transfer in condensed media. Lori, Armenia 6-12 Oct 1969, Erevan, 45-52 (1970) (Russ).
- SCHLAG, E. W., SCHNEIDER, S. and CHANDLER, D. W., "Fluorescence lifetimes of vibronic levels of naphthalene vapour", *Chem. Phys. Letters* **11**, N 4, 474-477 (1971) (Eng).
- SHARF, B., "Reverse deuteration effect. Interference effects in nonradiative decay", *J. Chem. Phys.* **55**, N 1, 320-324 (1971) (Eng).
- SIEBRAND, W., "Calculation of Franck-Condon factors for radiationless transitions based on selective excitation of single vibronic levels", *J. Chem. Phys.* **54**, N 1, 363-367 (1971) (Eng).
- SIEBRAND, W., "Franck-Condon factors for radiationless transitions", *J. Chem. Phys.* **55**, N 12, 5843 (1971) (Eng).
- SIEBRAND, W., "On the relation between radiative and nonradiative transitions in molecules", *Chem. Phys. Letters* **9**, N 2, 157-159 (1971) (Eng).

- SIMPSON, J. and OFFEN, H., "Deuterium and solvent effects on benzaldehyde phosphorescence", *Mol. Photochem.* **2**, N 2, 115-120 (1970) (Eng).
- SMITH, W. H., "Internal conversion in benzene, benzene- d_6 , and sulfur dioxide", *J. Chem. Phys.* **54**, N 10, 4169-4173 (1971) (Eng) (*P.A.* **74**: 44009).
- SOMMER, U., "Radiationless transitions in alternant hydrocarbons", *Chem. Phys. Letters* **8**, N 1, 111-113 (1971) (Eng) (*P.A.* **74**: 20846).
- SPENCER, R. D., VAUGHAN, W. M. and WEBER, G., "Dependence of fluorescence lifetimes upon the excitation and fluorescence spectra", In: *Molecular luminescence. An international conference.* New York-Amsterdam 607-629 (1969) (Eng).
- TAO, T., "Rotational diffusion coefficients and time dependent fluorescence depolarization", In: *Molecular luminescence. An international conference.* New York-Amsterdam 851-861 (1969) (Eng).
- THOMAS, M. F. and STEVENS, B., "Heavy-atom effects on the external quenching of molecular pyrene fluorescence in solution", In: *Molecular luminescence. An international conference.* New York-Amsterdam 153-165 (1969) (Eng).
- TOLSTOROZHEV, G. B. and BORISEVICH, N. A., "Efficiency of the quenching by oxygen of the fluorescence from complex molecular vapors", *Opt. and Spektrosk.* **29**, N 4, 701-705 (1970) (Russ) (*P.A.* **74**: 47676).
- VAUBEL, G. and BAESSLER, H., "Franck-Condon factors in intermolecular intersystem crossing", *Chem. Phys. Letters* **11**, N 5, 613-616 (1971) (Eng).
- VOLTZ, R., "Intermolecular energy transfer from excited Born-Oppenheimer states of polyatomic molecules", *Chem. Phys. Letters* **11**, N 2, 208-212 (1971) (Eng).
- VOROB'EV, V. P. and SHPAK, M. T., "Role of matrix triplet states in energy transfer processes in three-component frozen solutions", *Optics and Spectrosc.* **30**, N 3, 461-465 (1971) (Russ) (*P.A.* **74**: 80477).
- WERKHOVEN, C. J., DEINUM, T., LANGELAAR, J., RETTSCHNICK, R. P. H. and VAN VOORST, J. D. W., "Effects of intramolecular vibrational redistribution in the S_1 fluorescence of pyrene vapour", *Chem. Phys. Letters* **11**, N 4, 478-481 (1971) (Eng).
- WERKHOVEN, C. J., GELDOP, P. A., POST, M. F. M., LANGELAAR, J., RETTSCHNICK, R. P. H. and VAN VOORST, J. D. W., "Incomplete vibrational relaxation of pyrene in its first excited singlet state in the vapour phase", *Chem. Phys. Letters* **9**, N 1, 6-8 (1971) (Eng).
- WHITE, E. H., ROBERTS, D. R. and ROSWELL, D. F., "Energy transfer in chemiluminescence", In: *Molecular luminescence. An international conference.* New York-Amsterdam 479-492 (1969) (Eng).
- WINDSOR, M. W. and NOVAK, J. R., "Studies of radiationless transitions in coronene using nanosecond laser photolysis and spectroscopy", In: *Molecular luminescence. An international conference.* New York-Amsterdam 365-379 (1969) (Eng).
- YAKOVENKO, V. A. and PIKULIK, L. G., "On activation energy of radiationless transitions of phthalimide derivatives in gas phase", *Zh. Prikl. Spektrosk.* **15**, N 6, 1035-1040 (1971) (Russ).
- YAMADA, N., SHIONOYA, S. and KUSHIDA, T., "Phonon-assisted energy transfer-comparison between theory and experiment", *J. Phys. Soc. Japan* **30**, N 5, 1507 (1971) (Eng).
- ZHEVANDROV, N. D., GORSHKOV, V. K. and YASHIN, V. A., "Study of energy transfer in solutions of some aromatic hydrocarbons and luminogens", *Zh. Prikl. Spektrosk.* **15**, N 1, 107-111 (1971) (Russ).
- ZUSMAN, L. D. and BURSTEIN, A. I., "Kinetics of intermolecular energy transfer in condensed media", *Zh. Prikl. Spektrosk.* **15**, N 1, 124-130 (1971) (Russ).

3.9. Laser Excitation, Stimulated Emission and Light Generation

- ARISTOV, A. V. and KUZIN, V. A., "Generation of the stimulated radiation in many-component organoluminescent solutions", *Optics and Spectrosc.* **30**, N 1, 148-150 (1971) (Russ).
- ASLANIDI, E. B., TIKHONOV, E. A. and SHPAK, M. T., "On the nonlinear absorption of ruby laser radiation by azulene solutions", *Optics and Spectrosc.* **31**, N 3, 436-439 (1971) (Russ).
- BORISEVICH, N. A., GRUZINSKII, V. V., PALTARAK, N. M., SNAGOSHCHENKO, L. P. and SUCHKOV, V. A., "Generation and reconstruction of laser radiation bands in solutions of some organic compounds", *Zh. Prikl. Spektrosk.* **14**, N 1, 41-44 (1971) (Russ).
- CHRISTIAN, C. M. and ROBINSON, J. W., "Laser induced infrared fluorescence", *Spectrosc. Letters* **4**, N 8, 255-262 (1971) (Eng) (*P.A.* **75**: 826).
- DAYDOV, B. L., DERKACHEVA, L. D., DUNINA, V. V., ZHABOTINSKY, M. E., ZOLIN, V. F., KORENEVA, L. G. and SAMOKHINA, M. A., "Charge transfer and generation of the second harmonic of laser radiation in molecular crystals", *Optics and Spectrosc.* **30**, N 3, 503-507 (1971) (Russ).
- GODENKO, L. P., MANULISKY, A. D., ODULOV, S. G. and SOSKIN, M. S., "Generation of spectral heterogeneous media with asymmetrical luminescence bands", *Ukr. Fiz. Zh.* **16**, N 10, 1699-1702 (1971) (Russ).
- GONCHAROV, V. A., ZVEREV, G. M. and MARTYNOV, A. D., "On the effect of triplet levels on the energy characteristics of some xanthene dyes lasers in case of laser pumping", *Optics and Spectrosc.* **30**, N 1, 151-153 (1971) (Russ).
- KUHL, J. and MAROWSKY, G., "Narrow-band dye laser as a light source for fluorescence analysis in the subnanogram range", *Opt. Commun.* **4**, N 2, 125-128 (1971) (Eng).
- MASHKEVICH, V. S., "Universal correlation between radiation and absorption probabilities at quasi-equilibrium", *Dokl. Akad. Nauk SSSR* **196**, N 6, 1307-1309 (1971) (Russ).
- MAZURENKO, Yu. T., "On the polarization of luminescence of complex molecules under two-photon excitation. Dichroism of two-photon absorption of light", *Optics and Spectrosc.* **31**, N 5, 769-771 (1971) (Russ).
- MELISHCHUK, M. V., TIKHONOV, E. A. and SHPAK, M. T., "Organic dye metastable state effect on spontaneous and stimulated emission", *Ukr. Fiz. Zh.* **16**, N 3, 451-458 (1971) (Russ).
- NABOYKIN, Yu. V., OGURTSOVA, L. A., PODGORNYI, A. P. and PORROVSKAYA, F. S., "Special features of short range field of organic luminescent laser action under pumping by harmonics of solid-state lasers", *Optics and Spectrosc.* **31**, N 6, 1033-1034 (1971) (Russ).
- PEKAR, S. I. and KOCHELAP, V. A., "Einstein relations for stimulated chemiluminescence and their application to high-pressure chemical lasers", *Dokl. Akad. Nauk SSSR* **196**, N 4, 808-811 (1971) (Russ).
- STEPANOV, B. I., "Light generation by complex organic compounds", *Zh. Prikl. Spektrosk.* **15**, N 2, 359-370 (1971) (Russ).
- TOPP, M. R., RENTZEPIS, P. M. and JONES, R. P., "Time resolved picosecond emission spectroscopy of organic dye lasers", *Chem. Phys. Letters* **9**, N 1, 1-5 (1971) (Eng).

VARSANYI, F., "Surface lasers", *Appl. Phys. Letters* 19, N 6, 169-171 (1971) (Eng).
 WEBER, J., "Photochemical instability of rhodamin 6 G laser", *Z. Angew. Phys.* 31, N 1, 7-9 (1971) (Ger).

3.10. Spectroscopy of Photochemical Reactions

- AL-ANI, K. and PHILLIPS, D., "The photochemistry of the fluorotoluenes. I. Quantum yields of fluorescence and intersystem crossing in 1-fluoro-2-, 1-fluoro-3-, and 1-fluoro-4-methylbenzenes", *J. Phys. Chem.* 75, N 21, 3214-20 (1971) (Eng).
 BAIAMONTE, V. D., HARTSHORN, L. G. and BAIR, E. J., "Ozone ultraviolet photolysis. III. Disposition of vibrational energy", *J. Chem. Phys.* 55, N 8, 3617-3623 (1971) (Eng).
 BASILEVSKY, M. V., TIKHOMIROV, V. A. and CHLENOV, I. E., "The potential surfaces for the addition reactions of π -systems", *Theor. Chim. Acta* 23, N 1, 75-92 (1971) (Eng).
 BATEKHA, I. G., SHECK, Yu. B., KRYSANOV, S. A. and ALFIMOV, M. V., "Energy transfer from higher triplet levels as a cause of polymer photodestruction", *Dokl. Akad. Nauk SSSR* 197, N 3, 614-617 (1971) (Russ).
 BENSASSON, R. V., RICHARDS, J. T. and THOMAS, J. K., "The pulsed laser photolysis of benzene in cyclohexane", *Chem. Phys. Letters* 9, N 1, 13-16 (1971) (Eng).
 BIRKS, J. B., "Some photophysical processes in toluene", In: *Molecular luminescence. An international conference*, New York-Amsterdam 219-236 (1969) (Eng).
 BREWER, T. L., "Photophysical processes of *m*-difluorobenzene", *J. Phys. Chem.* 75, N 9, 1233-1236 (1971) (Eng) (*P.A.* 74: 61056).
 COMTET, M. and METTEE, H. D., "Comment on the photoisomerization of azulene", *Mol. Photochem.* 2, N 1, 63-66 (1970) (Eng).
 DAINTON, S. F., SALMON, G. A. and ZUCKER, U. F., "The radiolysis of *n*-propanol glass containing naphthalene or diphenyl", *Proc. Roy. Soc. London* 325A, N 1560, 23-33 (1971) (Eng).
 FOX, R. B., PRICE, T. R. and COZENS, R. F., "Photophysical processes in polymers. III. Properties of triplet energy traps in 1-vinylnaphthalene copolymers", *J. Chem. Phys.* 54, N 1, 79-84 (1971) (Eng).
 FRANKOVICH, Ye. L. and SOKOLIK, I. A., "Influence of magnetic field on velocity of photooxidation of aromatic hydrocarbons", *Zh. Eksp. Teor. Fiz. Pis'ma* 14, N 11, 577-580 (1971) (Russ).
 FRED, D. J. and FAULKNER, L. R., "Mechanisms of chemiluminescent electron-transfer reactions. I. The role of the triplet state in energy-deficient systems", *J. Amer. Chem. Soc.* 93, N 9, 2097-2102 (1971) (Eng).
 GAUTHIER-BODARD, and DEROULEDE, A., "Photoionization of solid solutions of durenene and biphenyl and spectral analysis of neutralisation luminescence", *J. Chim. Phys. phys.-chim. biol.* 67, N 10, 1733-1739 (1970) (Fr).
 GRELLMANN, K. H. and WATKINS, A. R., "The photoionization of perylene in acetonitrile solutions", *Chem. Phys. Letters* 9, N 5, 439-443 (1971) (Eng).
 HAFMANN, R., "Chemical reactivity of molecules in their excited states", In: *Aspects of modern quantum chemistry*, (Aspects de la chimie quantique contemporaine), Menton 8-13 Juillet 1970, 15, Quai Anatole-France-Paris-VIIE, Centre National de la Recherche Scientifique, 133-164 (1971) (Eng).
 HUNTER, T. F. and WYATT, R. F., "Primary photochemical processes in the sodium salt of 9,10-dihydroanthracene", *Trans. Faraday Soc.* 67, N 583, 2044-2049 (1971) (Eng).
 HUNZIKER, H. B. and WENDT, H. R., "Reaction rate of triplet benzene with monoolefins in the gas phase: direct observation by kinetic absorption spectroscopy", *Chem. Phys. Letters* 12, N 1, 181 (1971) (Eng).
 MAKUSHENKO, A. M., NEPORENT, B. S. and STOLBOVA, O. V., "Reversible orientational photodichroism and photoisomerization of aromatic azo-compounds", *Opt. and Spektrosk.* 31, N 4, 557-564 (1971) (Russ).
 NAFF, W. T., COMPTON, R. N. and COOPER, C. D., "Attachment of electrons to substituted benzenes", *J. Chem. Phys.* 54, N 1, 212-222 (1971) (Eng).
 NOYES, W. A., JR. and HARTER, D. A., "The photochemistry of the xylenes. A discussion of method", *J. Phys. Chem.* 75, N 18, 2741-2752 (1971) (Eng).
 OLSEN, K. J., "Radiolysis of benzene vapour by low-energy heavy ions", *Trans. Faraday Soc.* 67, N 583, 2050-2056 (1971) (Eng).
 ORAYEVSKIY, A. N., PIMENOV, V. P. and SHCHEGLOV, V. A., "Spreading of photochemical waves in binary gas media", In: *Kratkie soobshcheniya po fizike*, (Short communications on physics. Lebedev's Physical Institute of the Acad. of Sci. of the USSR), N 9, 7-12 (1971) (Russ).
 SCHWARTZ, F. P. and ALBRECHT, A. C., "One and two-photon photochemistry in rigid solutions of durenene in 3-methylpentane at 77°K", *Chem. Phys. Letters* 9, N 2, 163-165 (1971) (Eng).
 SINITSYNA, Z. A. and BAGDASARIAN, Kh. S., "Two-quantum sensitized reaction of photoionization", *Dokl. Akad. Nauk SSSR* 197, N 6, 1380-1382 (1971) (Russ).
 VESLEY, G. F., "The role of singlet and triplet states in aromatic substitution reactions", *J. Phys. Chem.* 75, N 12, 1775-1781 (1971) (Eng).
 WAGNER, P. J., "Kinetic analyses of photochemical reactions that involve quenching of two excited states", *Mol. Photochem.* 3, N 1, 23-34 (1971) (Eng).

4. Absorption and Luminescence Spectra of Intermolecular Complexes

4.1. Charge-transfer Complexes

- AOYAGI, Y., MASUDA, K. and NAMBA, S., "Electrical and magnetic properties of phthalocyanine iodine charge transfer complex", *J. Phys. Soc. Japan* 31, N 2, 524-528 (1971) (Eng).
 BARGERON, C. B. and DRICKAMER, H. G., "Effect of pressure on the electronic structure of complexes of ferrous iron with substituted phenanthrolines", *J. Chem. Phys.* 55, N 7, 3471-3482 (1971) (Eng).
 BEENS, H. and WELLER, A., "Classification and formation of charge-transfer complexes in the triplet state", In: *Molecular luminescence. An international conference*, New York-Amsterdam 203-217 (1969) (Eng).

- BHOWMIK, B. B., "Solvent effect on the charge transfer intensity of benzene-iodine complex", *Spectrochim. Acta* **27A**, N 2, 321-7 (1971) (Eng).
- BIRYUKOV, B. P. and STRUCHKOV, YU. T., "Structural chemistry of π -complexes of transient metals with carbonyl ligands. Part II. Carbonyl π -complexes with metal-metal bonds", *Kristallografiya* **7**, pt. 2, 142-239, Moscow (1971) (Russ).
- BRIEGLEB, G. and WOLF, D., "The problematic charge-transfer triplet state of electron-donor-acceptor-complexes", *Z. Naturforsch.* **25A**, N 12, 1925-1931 (1970) (Ger) (*P.A.* **74**: 24266).
- CARPER, W. R., BUSS, C. M. and HIPPE, G. R., "Nuclear magnetic resonance studies of molecular complexes", *J. Phys. Chem.* **74**, N 24, 4229-4234 (1970) (Eng).
- CHATTERJEE, S., "Studies of the charge-transfer complexes of 1,4-naphthoquinone acceptors", *J. Chem. Soc. B*, N 11, 2194-2197 (1971) (Eng).
- COOK, E. G. and SCHUG, J. C., "Intermolecular interactions and the weak benzene-halogen complexes", *J. Chem. Phys.* **53**, N 2, 723-734 (1970) (Eng).
- EGAWA, K., NAKASHIMA, N., MATAGA, N. and YAMANAKA, Ch., "Time-resolved fluorescence spectra of s -tetracyanobenzenetoluene complex", *Chem. Phys. Letters* **8**, N 1, 108-110 (1971) (Eng).
- FLURRY, R. L. Jr., "Molecular orbital theory of electron donor-acceptor complexes. IV. A self-consistent linear combination of molecular orbitals approximation", *Theor. Chim. Acta* **23**, N 1, 1-11 (1971) (Eng).
- FREYMAN, R., DUMAS, G., LE ROY, A. and VIENNOT, J.-P., "Low-temperature study of internal and external molecular vibrations-aromatic compounds, charge transfer complexes", *Mem. Soc. R. Sci. Liege* **8** (Belgium) **6**, N 2, 75-86 (1971) (*P.A.* **74**: 78941).
- GEORGE, W. O., LEIGH, M. J. and STRICKSON, J. A., "The infrared and Raman spectra of 2,5 and 2,6 dialkyl- p -benzoquinones", *Spectrochim. Acta* **27A**, N 8, 1235-1242 (1971) (Eng).
- GILMAN, F. B., Jr., "Luminescent properties of sensitizing dyes adsorbed to silver halide substrates", In: *Molecular luminescence. An international conference*. New York-Amsterdam 879-894 (1969) (Eng).
- GRONKIEWICZ, M. and PROCHOROW, J., "Fluorescence yield of pyromellitic dianhydride-methylbenzene charge-transfer complexes", *Bull. Acad. Pol. Sci., Ser. Math., Astron., Phys.* **19**, N 3, 263-266 (1971) (Eng).
- HAYASHI, H., NAGAKURA, S. and IWATA, S., "Phosphorescence and ESR spectra of the charge-transfer triplet states of some molecular complexes containing tetracyanobenzene as electron acceptor", In: *Molecular luminescence. An international conference*. New York-Amsterdam 351-363 (1969) (Eng).
- HUNTER, T. F., CUTRESS, N. C., MITCHINSON, K. M., ROWLEY, G. N. and STILLMAN, M., "Solvent effects on the equilibria of charge-transfer complexes", *Spectrochim. Acta* **27A**, N 7, 1207-1215 (1971) (Eng).
- ISHIDA, H. and TSUBOMURA, H., "Absorption spectra arising from the interaction between aromatic hydrocarbons and aliphatic amines", *Chem. Phys. Letters* **9**, N 4, 296-298 (1971) (Eng).
- KHOLMOGOROV, V. E., "Excitonic nature of the ESR signal in complexes of crystalline chlorophyll with electron acceptors", *Dokl. Akad. Nauk SSSR* **200**, N 2, 402-405 (1971) (Russ).
- KILLESREITER, H. and BAESSLER, H., "Exciton reaction at an anthracene/metal interface: charge transfer", *Chem. Phys. Letters* **11**, N 4, 411-414 (1971) (Eng).
- KOBAYASHI, T., YOSHIMURA, K. and NAGAKURA, S., "Charge-transfer interaction and fluorescence in some tetracyanobenzene complexes", *Bull. Chem. Soc. Japan* **44**, N 10, 2603-2610 (1971) (Eng).
- KURIK, M. V., LUKASH, S. I. and PROLOVA, E. K., "Study of the absorption band shape for the 9,10-dichloroanthracene and tetrachloroquinone complex with charge transfer", *Optics and Spectrosc.* **30**, N 3, 576-578 (1971) (Russ).
- LUCAS, H. C. and JACKSON, D. A., "The intensity and spectra of depolarized light scattered from benzene-nitrobenzene mixtures", *Mol. Phys.* **20**, N 5, 801-810 (1971) (Eng).
- MEMMING, R. and MÖLLERS, F., "Spectroscopic studies of electrochemical reactions of adsorbed dye layers", *Symp. Faraday Soc.* **4**, 145-150 (1970) (Eng).
- POTASHNIK, R. and OTTOLENGHI, M., "Absorption spectra of CT complexes in their lowest excited singlet states", *Chem. Phys. Letters* **6**, N 5, 525-528 (1970) (Eng).
- RAO, C. N. R., BHAT, S. N. and DWIVEDI, P. C., "Spectroscopy of electron donor-acceptor systems", *Appl. Spectrosc. Revs* **5**, N 1, 1-170 (1971) (Eng).
- SALTIEL, J., CURTIS, H. C. and JONES, B., "Benzene as a hydrogen donor in the photoreduction of benzophenone", *Mol. Photochem.* **2**, N 4, 331-339 (1970) (Eng).
- SMITH, D. L. and KEVAN, L., "Total charge-transfer cross sections in molecular systems", *J. Amer. Chem. Soc.* **93**, N 9, 2113-2117 (1971) (Eng).
- SOKOLOVA, I. V., TERPUGOVA, V. P. and KHOMUTOVA, V. P., "Calculation of molecular π -complexes in account of n -electrons", *Izv. Vyssh. Ucheb. Zaved., Fiz.* **12**, 132-133 (1971) (Russ).
- STIVASTAVA, R. D. and PRASAD, G., "Charge transfer interaction between 2,3-dichloro-5,6-dicyano- p -benzoquinone and substituted benzenes", *Bull. Chem. Soc. Japan* **43**, N 6, 1611-1614 (1970) (Eng).
- SUNDARAM, K. and PURCELL, W. P., "Theoretical study of a 1:1 complex between quinone and hydroquinone", *Int. J. Quantum Chem.* **5**, N 1, 101-110 (1971) (Eng).
- TETTELBAUM, Z., POTASHNIK, R. and OTTOLENGHI, M., "Triplet states in the pyrene-tetracyanobenzene charge-transfer system", *Mol. Photochem.* **3**, N 2, 107-122 (1971) (Eng).
- VARMA, C. A. G. O. and OOSTERHOFF, L. J., "The behaviour of the charge transfer band of E.D.A. complexes in a strong electric field", *Chem. Phys. Letters* **9**, N 5, 406-411 (1971) (Eng).
- VEMLUPALLI, G. K., "Geometry of the pyridine-iodine complex from the effect of an external electronic field on absorption", *J. Amer. Chem. Soc.* **92**, N 26, 7589-7590 (1970) (Eng).
- YAMADA, H. and KAWAMORI, M., "Polarized infrared spectra of chloranil-hexamethylbenzene complex", *Spectrochim. Acta* **27A**, N 11, 2425-2431 (1971) (Eng).
- YOSHIDA, Z. and KOBAYASHI, T., "SCFMO calculation of the 1:1 charge-transfer complex between benzene and p -benzoquinone by the variable integrals method II", *Theor. Chim. Acta* **23**, N 1, 67-74 (1971) (Eng).

4.2. Excimers, Dimers and Other Homomolecular Complexes

- BADGER, B. and BROCKLEHURST, B., "Absorption spectra of dimer cations. 4. Theoretical considerations and dimer structure", *Trans. Faraday Soc.* **66**, N 576, 2939-2947 (1970) (Eng).
- BAUR, H., "Remarks on the phonon-interaction in polymers", *Z. Naturforsch.* **26a**, N 6, 979-988 (1971) (Ger) (*P.A.* **74**: 52616).

- BEARDSLEE, R. A. and OFFEN, H. W., "Excimer delayed fluorescence of compressed naphthalene crystals", *J. Chem. Phys.* 55, N 7, 3516-3519 (1971) (Eng).
- BEENS, H., MÖHWALD, H., REHM, D., SACKMANN, E. and WELLER, A., "Fluorescence polarization studies of hetero-excimers oriented in liquid crystals", *Chem. Phys. Letters* 8, N 4, 341-344 (1971) (Eng).
- BIRKS, J. B., ALWATTAR, A. J. H. and LUMB, M. D., "Influence of environment on the radiative and radiationless transition rates of the pyrene excimer", *Chem. Phys. Letters* 11, N 1, 89-92 (1971) (Eng).
- CHANDRA, A. K. and LIM, E. C., "Excimer luminescence", In: *Molecular luminescence. An international conference*. New York-Amsterdam 249-266 (1969) (Eng).
- CHANDROSS, E. A. and THOMAS, H. T., "Intramolecular exciplex formation in naphthylalkylamines", *Chem. Phys. Letters* 9, N 5, 393-396 (1971) (Eng).
- COHEN, M. D., LUDMER, Z., THOMAS, J. M. and WILLIAMS, J. O., "The role of structural imperfections in the photodimerization of 9-cyanoanthracene. [Plates 24 to 27]", *Proc. Roy. Soc. London* 324A, N 1559, 459-468 (1971) (Eng).
- DE VRIES REILING, D. N., RETTSCHNICK, R. P. H. and HOYTINK, G. J., "Dimerization of 9,10-diazaphenanthrene", *J. Chem. Phys.* 54, N 6, 2722-2727 (1971) (Eng).
- DENARIEZ-ROBERGE, M.-M. and RULLIERES, C., "Stimulated emission in pyrene complexes", In: 1971 annual meeting of the Optical Society of America, Ottawa, Canada, 5-8 Oct 1971. Washington, D.C., USA: Optical Soc. America 34 (1971) (P.A. 75: 1706).
- FERGUSON, J. and MORRIS, J. M., "Aromatic hydrocarbon dimers", In: 8th Australian spectroscopy conference. Abstracts, Clayton, Australia, 16-20 Aug 1971. Clayton, Australia: Monash University (1971) (P.A. 75: 10361).
- GIJZEMAN, O. L. J., VAN LEEUWEN, W. H., LANGELAAR, J. and VAN VOORST, J. D. W., "Location of the triplet excimer level in pyrene", *Chem. Phys. Letters* 11, N 4, 532-534 (1971) (Eng) (P.A. 75: 4505).
- GIJZEMAN, O. L. J., LANGELAAR, J. and VAN VOORST, J. D. W., "Pressure effects on the triplet excimer emission in pyrene", *Chem. Phys. Letters* 11, N 4, 526-527 (1971) (Eng) (P.A. 75: 4484).
- GIJZEMAN, O. L. J., VAN LEEUWEN, W. H., LANGELAAR, J. and VAN VOORST, J. D. W., "Temperature dependence of the lifetime of pyrene triplet excimer emission", *Chem. Phys. Letters* 11, N 4, 528-531 (1971) (Eng).
- GOUTERMAN, M. and SAYER, P., "Sigma bond triplet excimers", *Chem. Phys. Letters* 8, N 1, 126-128 (1971) (Eng) (P.A. 74: 20825).
- GRENIÉ, Y., CORNU, J.-C. and LASSEGUES, J.-C., "Infrared spectra of matrix isolated acetic acid dimers", *J. Chem. Phys.* 55, N 12, 5844-5846 (1971) (Eng).
- HIRAYAMA, F. and LIPSKY, S., "Excimer fluorescence of alkyl substituted benzenes", In: *Molecular luminescence. An international conference*. New York-Amsterdam 237-247 (1969) (Eng).
- HOCHSTRASSER, R. M. and MALLIARI, A., "The luminescence of the pyrene-perylene system: evidence for mixed excimers in the solid state", *Mol. Cryst. and Liq. Cryst.* 11, N 4, 331-342 (1970) (Eng) (P.A. 74: 16682).
- IVANOV, A. A., PIRETSKIY, A. A., LUKASHIN, A. V., PERMOGOROV, V. I. and FRANK-KAMENETSKIY, M. D., "Electron-vibrational spectra of dimers in strong coupling limit", *Zh. Eksp. Teor. Fiz. Pis'ma* 14, N 7, 419-421 (1971) (Russ).
- JOHNSON, P. C. and OFFEN, H. W., "Excimer fluorescence of poly(N-vinylcarbazole)", *J. Chem. Phys.* 55, N 6, 2945-2949 (1971) (Eng).
- KIMURA, K., YAMAZAKI, T. and KATSUMATA, S., "Dimerization of the perylene and tetracene radical cations and electronic absorption spectra of their dimers", *J. Phys. Chem.* 75, N 12, 1768-1774 (1971) (Eng).
- KNIGHT, A. E. W. and SELINGER, B. K., "Time resolution of exciplex formation on a nanosecond scale", *Chem. Phys. Letters* 10, N 1, 43-48 (1971) (Eng) (P.A. 74: 57887).
- LANGELAAR, J., JANSSEN, G., RETTSCHNICK, R. P. H. and HOYTINK, G. J., "On the lifetime of triplet monomers and excimers of aromatic hydrocarbons in solution", *Chem. Phys. Letters* 12, N 1, 86-91 (1971) (Eng).
- LEFFEVRE, R. and GARCIA-SUORE, M., "Born-Oppenheimer approach to the study of the vibronic structure of dimers", In: *Molecular luminescence. An international conference*. New York-Amsterdam 657-665 (1969) (Eng).
- MASUJARA, H. and MATAGA, N., "Interactions between exciplexes in solution", *Chem. Phys. Letters* 7, N 4, 417-419 (1970) (Eng) (P.A. 74: 8213).
- MCDONALD, R. J. and SELINGER, B. K., "Fact and fallacy in fluorescence quenching. II. Exciplex formation", *Mol. Photochem.* 3, N 2, 99-106 (1971) (Eng).
- MCDONALD, R. J. and SELINGER, B. K., "Photoassociation due to electron transfer. Exciplex formation in non-polar solvents", *Aust. J. Chem.* 24, N 8, 1797-1805 (1971) (Eng).
- MINN, F. L., PINION, J. P. and FILIPESCU, N., "Excimer model for fluorene and dibenzofuran", *J. Phys. Chem.* 75, N 12, 1794-1798 (1971) (Eng) (P.A. 74: 64208).
- MORRIS, J. M. and FERGUSON, J., "Calculation of spectra of aromatic hydrocarbon dimers", In: 8th Australian spectroscopy conference. Abstracts, Clayton, Australia, 16-20 Aug 1971. Clayton, Australia: Monash University (1971) (P.A. 75: 8717).
- PHILPOTT, M. R., "Exciton theory of the electronic states of dye-polymer complexes. III. Configurationally induced optical rotatory dispersion of dye transitions in helical complexes", *J. Chem. Phys.* 55, N 8, 4005-4011 (1971) (Eng).
- POST, M. F. M., LANGELAAR, J. and VAN VOORST, J. D. W., "Singlet excited monomer and excimer absorptions of pyrene", *Chem. Phys. Letters* 10, N 4, 468-472 (1971) (Eng).
- POTASHNIK, R., GOLDSCHMIDT, C. R., OTTOLENGHI, M. and WELLER, A., "Absorption spectra of exciplexes", *J. Chem. Phys.* 55, N 11, 5344-5348 (1971) (Eng).
- ROOD, A. P., EMERSON, D. and MILLER, H. J., "Photodimerization of anthracene single crystals *in situ* in the electron microscope", *Proc. Roy. Soc. London* 324A, N 1556, 37-43 (1971) (Eng).
- TOMURA, M. and TAKAHASHI, Y., "Migration of excimer energy in pyrene crystal", *J. Phys. Soc. Japan* 31, N 3, 797-801 (1971) (Eng).
- VU THIEN HAN, "Transition excimer-monomer at electroluminescence", *C. R. Acad. Sci., Paris* 273B, N 17, 777-780 (1971) (Fr).
- WALKER, M. S., BEDNAR, T. W. and LUMRY, R., "Exciplex studies III. Radiative and non-radiative relaxation of the fluorescence state of indole and methyl derivatives of indole", In: *Molecular luminescence. An international conference*. New York-Amsterdam 135-152 (1969) (Eng).
- WELLER, A. and ZACHARIASSE, K., "Direct hetero-excimer formation from radical ions", *Chem. Phys. Letters* 10, N 5, 590-594 (1971) (Eng).

- WITKOWSKI, A. and ZGIERSKI, M., "Decoupling conditions for the vibronic equation in dimers", *Int. J. Quantum Chem.* 4, N 4, 427-429 (1970) (Eng).
 YOSHIHARA, K., KASUYA, T., INOUE, A. and NAGAKURA, S., "Time resolved spectra of pyrene excimer and pyrenedimethylaniline exciplex", *Chem. Phys. Letters* 9, N 5, 469-472 (1971) (Eng).
 ZUBKOVA, O. B. and SHABADASH, A. N., "Study of the IR spectra of the monomer, dimer and trimer of ethylene glycol", *Zh. Prikl. Spektrosk.* 14, N 5, 874-878 (1971) (Russ) (P.A. 74: 61062).

5. Spectra of Pure Molecular Crystals

5.1. Electronic and Vibronic States and Absorption Spectra

- AHRENKIEL, R. K., "Modified Kramers-Kronig analysis of optical spectra", *J. Opt. Soc. Amer.* 61, N 12, 1651-1655 (1971) (Eng) (P.A. 75: 1678).
 AKASAKA, Y., MURAKAMI, K., MASUDA, K. and NAMBA, S., "Optical absorption bands of the radical in irradiated anthracene single crystals", *Mol. Cryst. and Liq. Cryst.* 13, N 4, 377-380 (1971) (Eng) (P.A. 74: 53238).
 ARNOLD, S., WHITTEN, W. B. and DAMASK, A. C., "Davydov splitting and band structure for triplet excitons in pyrene", *Phys. Rev.* B3, N 10, 3452-3457 (1971) (Eng) (P.A. 74: 37633).
 BENDERSKII, V. A. and LAVRUSHKO, A. G., "Light reabsorption and photoconductivity of anthracene crystals", *Fiz. Tverd. Tela* 13, N 5, 1282-1287 (1971) (Russ).
 BENDERSKII, V. A. and KHUDYAEV, S. I., "On the calculation of light reabsorption in molecular crystals", *Opt. and Spektrosk.* 31, N 6, 915-918 (1971) (Russ).
 BREE, A. and ZWARICH, R., "Electronic spectra of dibenzothiophene", *Spectrochim. Acta* 27A, N 4, 621-630 (1971) (Eng).
 BRILLANTE, A. and ZAULI, C., "Intensities in polarized light: near ultraviolet absorption spectrum of 1,2,4,5-tetramethylbenzene", *Trans. Faraday Soc.* 67, N 580, 913-921 (1971) (Eng) (P.A. 74: 53189).
 BRITH, M., LUBART, R. and STEINBERGER, I. T., "Reflection and absorption spectra of the higher $\pi \rightarrow \pi^*$ transitions of solid benzene", *J. Chem. Phys.* 54, N 12, 5104-5113 (1971) (Eng) (P.A. 74: 49580).
 BRODIN, M. S., DUDINSKY, M. A. and MARISOVA, S. V., "Spectral evidence of surface states in the anthracene crystal", *Opt. and Spektrosk.* 31, N 5, 749-754 (1971) (Russ).
 BROUDE, V. L., "Polarization of bands in the absorption spectrum of benzene crystal", *Opt. and Spektrosk.* 30, N 1, 89-98 (1971) (Russ) (P.A. 74: 59355).
 BUXTON, R. A. H. and DULEY, W. W., "Vacuum ultraviolet reflection spectrum of solid oxygen", *Opt. Commun.* 3, N 3, 137-140 (1971) (Eng).
 CHAKRAVORTY, S. C. and GANGULY, S. C., "Anisotropy of absorption spectra of the single crystal of toluene", *Z. Phys. Chem. Frankfurt* 72, N 1-3, 34-37 (1970) (Eng).
 CHAKRAVORTY, S. C. and GANGULY, S. C., "Polarized absorption spectra of fluorene single crystal", *J. Phys.* B2, N 11, 1235-1239 (1969) (Eng).
 CHAUDHURI, M. K., "Absorption spectrum of 2-naphthoic acid: pure and mixed crystal", *J. Phys.* C4, N 7, 827-831 (1971) (Eng).
 CHONG, T. and ITOH, N., "Vibronic transitions in radicals in irradiated naphthalene single crystals", *Mol. Cryst. and Liq. Cryst.* 11, N 3, 315-318 (1970) (Eng) (P.A. 74: 13479).
 COOK, B. E. and LE COMBER, P. G., "The optical properties of anthracene crystals in the vacuum ultraviolet", *J. Phys. Chem. Solids* 32, N 6, 1321-1329 (1971) (Eng).
 ERMAKOVA, E. G., KRASNOVA, T. L., MOSIN, A. M., ONOPRIENKO, M. I., CHERNYSHEV, E. A. and SHPAK, M. T., "Electron-vibronic spectra of elementoorganic compounds of the series $C_6H_5(CH_2)_nSi(CH_3)_3$ ", *Ukr. Fiz. Zh.* 16, N 4, 627-636 (1971) (Russ).
 ERMAKOVA, E. G., KRASNOVA, T. L., MOSIN, A. M., ONOPRIENKO, M. I., CHERNYSHEV, E. A. and SHPAK, M. T., "Ultra-violet absorption spectra of benzyl compounds containing the elements of group IVb", *Ukr. Fiz. Zh.* 16, N 6, 900-908 (1971) (Russ).
 GERKIN, R. E. and SZERENYI, P., "Electron paramagnetic resonance absorption in oriented phosphorescent triphenylene- h_{12} and triphenylene- d_{12} from 4 to 250°K", *J. Chem. Phys.* 55, N 5, 2575-2592 (1971) (Eng).
 HOCHSTRASSER, R. M. and ZEWAHL, A. H., "Stark and Zeeman effects on the singlet $n\pi$ state of s-triazine", *Chem. Phys. Letters* 11, N 2, 157-158 (1971) (Eng).
 HOCHSTRASSER, R. M. and WIERSMA, D. A., "Structure and dipole moment of the first electronically excited state of pyridine N-oxide", *J. Chem. Phys.* 55, N 11, 5339-5343 (1971) (Eng).
 HOCHSTRASSER, R. M., WESSEL, J. E. and ZEWAHL, A. H., "Zeeman effect studies of the triplet states of benzene", *J. Chem. Phys.* 55, N 7, 3596-3597 (1971) (Eng).
 HODGKINSON, K. A. and MUNRO, I. H., "The transient absorption spectra of chrysene and 1,2,7,8-dibenzanthracene", *Chem. Phys. Letters* 12, N 2, 281-284 (1971) (Eng).
 ISHIHARA, Y. and NAKADA, T., "The activation energy in the optical absorption edge of crystalline anthracene", *Techn. Rept. ISSP A* N 415 (1970) (Eng).
 KILLSEITER, H. and BAESSLER, H., "Exciton reaction at an anthracene/metal interface: charge transfer", *Chem. Phys. Letters* 11, N 4, 411-414 (1971) (Eng).
 KLIMUSHEVA, G. V. and SOROKA, G. M., "Electron-vibration structure of spectra of some benzene polyfluorine derivatives crystals", *Ukr. Fiz. Zh.* 16, N 2, 309-319 (1971) (Russ).
 KLIMUSHEVA, G. V. and YAREMKO, R. V., "On the exciton states of some pure and mixed molecular crystals. I. Absorption spectra of *p*-dichloro-, *p*-dibromo- and *p*-chlorobromobenzene crystals", *Opt. and Spektrosk.* 31, N 2, 243-248 (1971) (Russ).
 KLIMUSHEVA, G. V. and SOROKA, G. M., "Some peculiarities of electronic spectra of polyfluoro-substituted benzene", *Teor. Ekspr. Khim.* 7, N 4, 491-497 (1971) (Russ).
 KOCH, E. E., KUNSTREICH, S. and OTTO, A., "Measurements of electron energy losses and VUV-reflectivity of anthracene single crystals", *Opt. Commun.* 2, N 8, 365-369 (1971) (Eng).
 KROCHUK, A. S., KURIK, M. V. and SMISHKO, E. V., "Temperature dependence of the parameters of the exciton absorption bands of phenanthrene", *Opt. and Spektrosk.* 30, N 3, 442-444 (1971) (Russ) (P.A. 74: 80442).
 KURIK, M. V., MANZHARA, V. S. and TSIKORA, L. I., "Investigation of the exciton-phonon interaction in naphthalene", *Fiz. Tverd. Tela* 13, N 3, 716-719 (1971) (Russ) (P.A. 74: 41576).

MOLCALC F

- MORRIS, G. C., RICE, S. A., SCEATS, M. G. and MARTIN, A. E., "Absorption band profile of the origin region of the b polarized 4000 Å anthracene crystal transition", *J. Chem. Phys.* **55**, N 12, 5610-5621 (1971) (Eng).
- MÜLLER, L. GEORGESCU, I. J. and OPRICA, D., "Electrical properties and optical absorption of two derivatives of stilbene", *Phys. Stat. Sol.(a)* **2**, N 3, 441-446 (1970) (Eng).
- PELANT, I., "Two-photon absorption in solids", *Cesk. Cas. Fiz. A* **21**, N 3, 300-314 (1971) (P.A. 74: 69878).
- RÖSSLER, U., "Interpretation of far UV spectra in solid rare gases from calculated density of states", *Phys. Stat. Sol.(b)* **45**, N 2, 483-491 (1971) (Eng) (P.A. 74: 53213).
- SCHARBER, S. R., JR. and WEBBER, S. E., "Optical constants of simple molecular crystals. I. Results for CO and O₂", *J. Chem. Phys.* **55**, N 8, 3977-3985 (1971) (Eng) (P.S. 74: 80380).
- SCHARBER, S. R., JR. and WEBBER, S. E., "Optical constants of simple molecular crystals. II. Results for Kr and Xe", *J. Chem. Phys.* **55**, N 8, 3985-3993 (1971) (Eng) (P.A. 74: 80381).
- STEPHENSON, P. B., "Absorption spectrum of ferrocene at 4.2 °K", *J. Chem. Phys.* **55**, N 1, 473-474 (1971) (Eng).
- TANAKA, M. and TANAKA, J., "Absorption spectra of crystals of cytosine and its derivatives", *Bull. Chem. Soc. Jap.* **44**, N 3, 672-674 (1971) (Eng).
- TROMMSDORFF, H. P. and MENTZAFOS, D., "Observation of a magnetic dipole transition in the n - π singlet-singlet absorption spectrum of duroquinone", *Chem. Phys. Letters* **10**, N 5, 569-571 (1971) (Eng).
- TUBBS, M. R., "A spectroscopic interpretation of crystalline ionicity", *Phys. Stat. Sol.* **41**, N 1, K61-64 (1970) (Eng).

5.2. Vibrational and Phonon Spectra

- ABRAMOWITZ, S. and LEVIN, I. W., "Raman spectra of the hexahalogenated benzenes in the solid phase", *Spectrochim. Acta* **26A**, N 12, 2261-2268 (1970) (Eng) (P.A. 74: 16655).
- BATES, J. B., THOMAS, D. M., BANDY, A. and LIPPINCOTT, E. R., "Polarized vibrational spectra of single crystal hexachlorobenzene", *Spectrochim. Acta* **27A**, N 5, 637-648 (1971) (Eng) (P.A. 74: 41605).
- BEZOT, P., SHELFENSTEIN, M. and SZWARC, H., "Far infrared spectrum of the γ -phase of p -dichlorobenzene", *Mol. Cryst. and Liq. Cryst.* **15**, N 3, 273-275 (1971) (Eng) (P.A. 75: 7077).
- BREE, A., KYDD, R. A., MISRA, T. N. and VILKOS, V. V. B., "The fundamental frequencies of pyrene and pyrene- d_{10} ", *Spectrochim. Acta* **27A**, N 11, 2315-2332 (1971) (Eng).
- BREE, A., PANG, C. Y. and RABENECK, L., "The Raman spectrum of biphenyl and biphenyl- d_{10} ", *Spectrochim. Acta* **27A**, N 8, 1293-1298 (1971) (Eng) (P.A. 74: 57915).
- BREE, A. and ZWIRICH, R., "The vibrations of dibenzothiophene", *Spectrochim. Acta* **27A**, N 4, 599-620 (1971) (Eng).
- BRIGODIOT, M. and LEBAS, J.-M., "Comparative assignment of the vibrations spectra of some 9- and 9,10-substituted anthracene derivatives. II. 650 to 1650 cm^{-1} region", *Spectrochim. Acta* **27A**, N 8, 1315-1324 (1971) (Fr) (P.A. 74: 57904).
- COLOMBO, L. and MATHIEU, J. P., "External vibrations of acenaphthene crystals", *Spectrochim. Acta* **27A**, N 10, 2101-2104 (1971) (Fr) (P.A. 74: 80441).
- COLOMBO, L. and FUKUO, K., "Low-frequency Raman spectrum of benzoic single crystals", *Spectrochim. Acta* **27A**, N 9, 1773-1784 (1971) (Eng).
- DUMAS, G. G. and MICHEL, J., "Low frequency Raman spectrum phase transition in hexamethylbenzene", *C. R. Acad. Sci., Paris* **272B**, N 14, 838-839 (1971) (Fr).
- DUMAS, G. G. and VIENNOT, J.-P., "Molecular motion in crystals and low-frequency Raman spectra", In: 2nd international conference on Raman spectroscopy (abstracts), Oxford, England, 13-17 Sep 1970. Bradford, Yorks, England: Univ. Bradford (1970) (P.A. 74: 41606).
- FAYROT, J. and LEBAS, J.-M., "Vibrational study of 1,3,5-methyl substituted benzene derivatives $\text{C}_6\text{H}_3(\text{CH}_3)_3$, $\text{C}_6\text{H}_3(\text{CH}_3)_2\text{Br}$, $\text{C}_6\text{H}_3(\text{CH}_3)_2\text{I}$ ", *J. Chim. Phys. phys.-chim. biol.* **68**, N 5, 747-752 (1971) (Fr) (P.A. 74: 57908).
- FREYMAN, R., DUMAS, G., LE ROY, A. and VIENNOT, J.-P., "Low-temperature study of internal and external molecular vibrations-aromatic compounds, charge transfer complexes", *Mém. Soc. R. Sci. Liege* **8°** (Belgium), **6**, N 2, 75-86 (1971) (P.A. 74: 78941).
- FYFE, C. A., DUNELL, B. A. and RIMMESTER, J., "Nuclear magnetic resonance investigation of possible molecular motion in coronene, perylene, and triphenylene in the solid state", *Canad. J. Chem.* **49**, N 20, 3332-3335 (1971) (Eng).
- GREEN, J. H. S., HARRISON, D. J. and KYNASTON, W., "Vibrational spectra of benzene derivatives. XI. 1,3,5- and 1,2,3-trisubstituted compounds", *Spectrochim. Acta* **27A**, N 6, 793-806 (1971) (Eng) (P.A. 74: 47686).
- GREEN, J. H. S., HARRISON, D. J. and KYNASTON, W., "Vibrational spectra of benzene derivatives. XII. 1,2,4-trisubstituted compounds", *Spectrochim. Acta* **27A**, N 6, 807-815 (1971) (Eng) (P.A. 74: 47687).
- GREEN, J. H. S. and LAUWERS, H. A., "Vibrational spectra of benzene derivatives. XIII. The dinitrobenzenes", *Spectrochim. Acta* **27A**, N 6, 817-824 (1971) (Eng) (P.A. 74: 47688).
- GREEN, J. H. S., HARRISON, D. J. and KYNASTON, W., "Vibrational spectra of benzene derivatives. XIV. Mono substituted phenols", *Spectrochim. Acta* **27A**, N 10, 2199-2217 (1971) (Eng).
- HARADA, I. and SHIMANOUCHI, T., "Far-infrared spectra and lattice vibrations of crystalline benzene", *J. Chem. Phys.* **55**, N 7, 3605-3607 (1971) (Eng) (P.A. 74: 76974).
- JULIEN-LAFERRIER, S., LEBAS, J. M. and LECOMTE, J., "Interpretation of the vibrational spectra of polycrystalline p -xylene at -180 deg. Relation with crystal symmetry", *C. R. Acad. Sci., Paris* **272B**, N 3, 224-227 (1971) (Fr).
- KJEMS, J. K., REYNOLDS, P. A. and WHITE, J. W., "Density of states measurements for phonons in aromatic crystals", In: *Phonons*. Université de Rennes. July 26-29 1971. Abstracts. p. F1/1.
- KONDILENKO, I. I., KOROTKOV, P. A. and LITVINOV, G. S., "Dependence of the Davydov's splitting value in Raman spectrum on elementary crystal cell parameters", *Optics and Spectrosc.* **31**, N 2, 234-242 (1971) (Russ).
- KONDILENKO, I. I., KOROTKOV, P. A. and LITVINOV, G. S., "Evidence of Davydov's splitting in Raman spectrum of naphthalene", *Opt. and Spektrosk.* **30**, N 3, 437-441 (1971) (Russ).
- LAUFER, J. C. and KOPELMAN, R., "The carbon-13 shift in the benzene a_{2u} mode and the infrared

- exciton spectrum of the natural abundance benzene crystal", In: 26th symposium on molecular structure and spectroscopy. Abstracts, Columbus, Ohio, USA, 14-18 Jun 1971. Columbus, Ohio, USA: Ohio State Univ. 31 (1971) (P.A. 75: 10397).
- LECOLIER, G. V., WYNCKE, B. and HADNI, A., "Far infrared absorption spectra of biphenyl crystal at the temperature of liquid nitrogen and helium", *J. Chim. Phys. phys.-chim. biol.* 68, N 11-12, 1606-1607 (1971) (Fr).
- MARQUETON, Y. and DECAMPS, E.-A., "Phonon spectrum of paraterphenyl by Raman laser spectroscopy at 300° and 90°K", *C. R. Acad. Sci., Paris* 271B, N 13, 644-647 (1970) (Fr).
- MATTHEWS, R. S., JONES, D. W. and BARTLE, K. D., "High-resolution nuclear magnetic resonance spectra of phenanthrenes—V. Dibenzoc[*c,g*] phenanthrene and benzo(*g,h,i*) perylene", *Spectrochim. Acta* 27A, N 7, 1185-1195 (1971) (Eng).
- MENEELY, C. T., SHE, C. Y. and EDWARDS, D. F., "Line-shape parameters of the Raman lines of chloro-, bromo-, and iodobenzene", *J. Mol. Spectrosc.* 39, N 1, 73-78 (1971) (Eng).
- MULLER, D. E., INOUE, T., LARKIN, R. H. and STIDHAM, H. D., "Lattice vibrations of crystal 1,3,5-trichlorobenzene and 1,3,5-tribromobenzene", *Spectrochim. Acta* 27A, N 3, 405-408 (1971) (Eng) (P.A. 74: 33458).
- STENMAN, F., "Raman scattering from molecular crystals. I. Powdered naphthalene", *J. Chem. Phys.* 54, N 10, 4217-4222 (1971) (Eng).
- ### 5.3. Fluorescence and Phosphorescence
- AZUMI, T., "Defect phosphorescence of pyrazine crystals", In: Conference on scintillator and liquid scintillation counting, San Francisco, Calif. USA, 7-10 July 1970. San Francisco, Calif. USA: Univ. Calif., San Francisco (1970) (Eng) (P.A. 74: 9924).
- AZUMI, T., "Zeeman effect of phosphorescence", In: *Molecular luminescence. An international conference*. New York-Amsterdam 79-92 (1969) (Eng).
- BABENKO, S. D., BENDERSKIL, V. A. and LAVRUSHKO, A. G., "Investigation of fluorescence and photoconductance of aromatic hydrocarbon crystals and solutions", *Zh. Prikl. Spektrosk.* 14, N 1, 111-114 (1971) (Russ) (P.A. 74: 37631).
- BAIWIR, M., "Electron spin resonance of phosphorescent dibenzothiophene", *Chem. Phys. Letters* 9, N 5, 482-484 (1971) (Eng).
- BEARDSLEE, R. A. and OFFEN, H. W., "Excimer delayed fluorescence of compressed naphthalene crystals", *J. Chem. Phys.* 55, N 7, 3516-3519 (1971) (Eng).
- BENZ, K. W., PORT, H. and WOLF, H. C., "Delayed fluorescence and phosphorescence of pure naphthalene crystals", *Z. Naturforsch.* 26a, N 5, 787-793 (1971) (Ger).
- BERTAULT, M. and DELACOTE, G., "Study of delayed luminescence of durene monocrystals", *J. Chim. Phys. phys.-chim. biol.* 67, N 10, 1740-1744 (1970) (Fr).
- BORKMAN, R. F., "Deuterium effect on the phosphorescence lifetime of biacetyl crystal and vapor", *Chem. Phys. Letters* 9, N 1, 77-79 (1971) (Eng).
- CHAKRABARTI, S. K., "The polarized fluorescence excitation spectra of aromatic hydrocarbons", *J. Mol. Spectrosc.* 37, N 3, 571-574 (1971) (Eng) (P.A. 74: 35823).
- CRAIG, D. P., "Radiative corrections and transitions in molecular crystals", In: 8th Australian spectroscopy conference. Abstracts, Clayton, Australia, 16-20 Aug 1971. Clayton, Australia: Monash University P1 (1971) (P.A. 75: 10334).
- CREUZBURG, M., "VUV emission from solid krypton and xenon", *Solid State Commun.* 9, N 10, 665-667 (1971) (Eng) (P.A. 74: 49616).
- ERN, V., SUNA, A. and MERRIFIELD, R. E., "Dependence of delayed fluorescence on the velocity of a moving pattern of light", *J. Appl. Phys.* 42, N 7, 2770-2773 (1971) (Eng) (P.A. 74: 49622).
- ERN, V., SAINT-CLAIR, J. L., SCHOTT, M. and DELACOTE, G., "Effects of exciton interactions on the fluorescence yield of crystalline tetracene", *Chem. Phys. Letters* 10, N 3, 287-290 (1971) (Eng) (P.A. 74: 62402).
- EWALD, M. and DUROCHER, G., "Photoionization and recombination delayed fluorescence in anthracene single crystals", *Chem. Phys. Letters* 12, N 2, 385-388 (1971) (Eng).
- FREEMAN, C. G., MCEWAN, M. J., CLARIDGE, R. F. C. and PHILLIPS, L. F., "Band fluorescence of xenon", *Chem. Phys. Letters* 10, N 5, 530-532 (1971) (Eng) (P.A. 74: 75863).
- GEORGE, G. A. and MORRIS, G. C., "Oscillator strengths of singlet triplet transitions of molecular crystals from phosphorescence excitation spectra", *Mol. Cryst. and Liq. Cryst.* 11, N 2, 195-202 (1970) (Eng) (P.A. 74: 2909).
- GOODE, D. H. and WILLIAMS, D. F., "Isolation of the phosphorescence spectrum of crystalline anthracene", *Phys. Can.* 27, N 4, 80 (1971) (P.A. 74: 66131).
- GRIBKOV, V. I., "Measuring of phosphorescence polarization", *Zh. Prikl. Spektrosk.* 15, N 1, 166-168 (1971) (Russ).
- GRZYWACZ, J., "Remarks on the correction for reabsorption", *J. Luminescence* 4, N 3, 244-248 (1971) (Eng) (P.A. 75: 10434).
- GWAIZ, A. A. and EL-SAYED, M. A., "Assignment of the lowest triplet state of benzene using phosphorescence-microwave double resonance (PMDR) techniques", *Chem. Phys. Letters* 9, N 5, 454-456 (1971) (Eng) (P.A. 74: 47631).
- HALL, L. H. and EL-SAYED, M. A., "Optical determination of the electron spin-lattice relaxation mechanisms between the zero-field levels of the lowest triplet state", *J. Chem. Phys.* 54, N 11, 4958-4959 (1971) (Eng).
- HALL, L., OWENS, D. and EL-SAYED, M. A., "Relaxation mechanisms of the Zeeman sublevels of the phosphorescent triplet state of pyrazine at 1.6 K", *Mol. Phys.* 20, N 6, 1025-1041 (1971) (Eng) (P.A. 74: 37638).
- HOCHSTRASSER, R. M., WESSEL, J. E., WHITEMAN, J. D. and ZEWAHL, A. H., "Characterization of triplet states of axially symmetric benzenes using the Zeeman effect", *Chem. Phys. Letters* 10, N 4, 452-454 (1971) (Eng).
- KAWABE, M., MASUDA, K. and NAMBA, S., "Electroluminescence of green light region in doped anthracene", *Jap. J. Appl. Phys.* 10, N 4, 527-529 (1971) (Eng).
- KAWAKUBO, T., "Emission of some naphthalene derivatives in the solid state", *J. Phys. Soc. Japan* 31, N 5, 1446-1449 (1971) (Eng).
- KILPPER, D. and SCHWOERER, M., "Zeeman effect in the phosphorescence of naphthalene mixed crystals", *Z. Naturforsch.* 26a, N 9, 1425-1434 (1971) (Ger) (P.A. 74: 80490).

- KOYANAGI, M., SHIGEOKA, T. and KANDA, Y., "Exciton migration in triplet states of pyrazine and deuterated pyrazines in the crystal", In: *Molecular luminescence. An international conference*. New York-Amsterdam 765-772 (1969) (Eng).
- KRISCH, O., "Quenching of luminescence of organic crystals by X-rays", *Z. Phys.* **244**, N 5, 468-481 (1971) (Ger) (P.A. 74: 49620).
- LAPORTE, J.-L., LOCHET, R., NOUCHI, G. and ROUSSET, Y., "Luminescence of benzophenone near liquid helium temperature", *C. R. Acad. Sci., Paris* **275B**, N 3, 124-127 (1971) (Fr).
- LOGAN, L. M., MUNRO, I. H., WILLIAMS, D. F. and LIPSETT, F. R., "Low temperature studies of fluorescence emission from anthracene crystals", In: *Molecular luminescence. An international conference*. New York-Amsterdam 773-785 (1969) (Eng).
- LUMB, M. D. and AL-CHALABI, A. O., "The fluorescence quantum yield and lifetime of crystalline benzene at low temperatures", *J. Phys. C4*, N 14, 365-367 (1971) (Eng) (P.A. 75: 4500).
- PANT, D. D., BHAGCHANDANI, C. L., PANT, K. C. and VERMA, S. P., "Aggregation in xanthene dyes, exciton emission and phosphorescence enhancement", *Chem. Phys. Letters* **9**, N 6, 546-547 (1971) (Eng) (P.A. 74: 56254).
- PERETTI, P., RANSON, P. and ROUSSET, Y., "Phosphorescence of benzophenone and mixed benzophenone-naphthalene crystals due to two-photon nonlinear absorption", *C. R. Acad. Sci., Paris* **273B**, N 5, 251-254 (1971) (Fr).
- PERKAMPUS, H. H. and STICHTENOTH, H., "Fluorescence decay-times in thin anthracene films", *Z. Phys. Chem. Frankfurt* **76**, N 1-2, 18-37 (1971) (Ger) (P.A. 75: 10443).
- ROUSSET, Y. and SANCEY, J., "Delayed fluorescence of acene crystals", *J. Chim. Phys. phys.-chim. biol.* **68**, N 3, 373-383 (1971) (Eng) (P.A. 74: 53281).
- SIMPSON, J. D. and OFFEN, H. W., "Defect phosphorescence of benzophenone crystals", *J. Chem. Phys.* **55**, N 3, 1323-1326 (1971) (Eng) (P.A. 74: 66132).
- SIXL, H. and SCHWOERER, M., "Phosphorescence dynamics in the optical detection of ESR in naphthalene. Magnetic field effects", In: *Abstracts of the conference on magnetic resonance and related phenomena*, Bucharest, Romania, 1-5 Sept 1970. Bucharest, Romania: Inst. Atomic Phys. 111 (1971) (P.A. 75: 10527).
- VAN EGMOND, J., BURLAND, D. M. and VAN DER WAALS, J. H., "The Zeeman effect in the benzene B_{2u} state. Evidence for a dynamic pseudo-Jahn-Teller distortion", *Chem. Phys. Letters* **12**, N 1, 206-210 (1971) (Eng).
- WEGNER, U. E., KROES, R. L., KULSHRESHTHA, A. P. and MOOKHERJEE, T., "Fluorescence of chrysene crystals", *J. Luminescence* **4**, N 2, 134-136 (1971) (Eng) (P.A. 74: 80485).
- YOSHINO, K., KANEKO, K., KYOKANE, J. and INUISHI, Y., "Fluorescence spectra of phthalocyanine single crystals", *J. Phys. Soc. Japan* **31**, N 5, 1594 (1971) (Eng).
- ZALEWSKI, E. F. and MCCLURE, D. S., "An unusual site interaction in the triplet emission spectrum of pyrazine", In: *Molecular luminescence. An international conference*. New York-Amsterdam 739-749 (1969) (Eng).

6. Spectra of Impurity Molecular Crystals

- AKASAKA, Y., MURAKAMI, K., MASUDA, K. and NAMBA, S., "Optical absorption bands of the radical in irradiated anthracene single crystals", *Mol. Cryst. and Liq. Cryst.* **13**, N 4, 377-380 (1971) (Eng) (P.A. 74: 53238).
- AKASAKA, Y., MASUDA, K. and NAMBA, S., "Paramagnetic defects induced in naphthalene and anthracene single crystals by neutron irradiation at low temperature", *J. Phys. Soc. Japan* **30**, N 6, 1686-1689 (1971) (Eng).
- AUBRIOT, E., BALCOU, Y. and MEINNEL, J., "Freedom of molecular orientation in the crystal lattice and dielectric properties of trichloro-1,4,6-naphthalene", *C. R. Acad. Sci., Paris* **272B**, N 12, 747-749 (1971) (Fr) (P.A. 74: 40738).
- ATRICH, F. and MARQUARD, J., "Fast depopulation of triplet exciton traps and delayed fluorescence of crystalline benzene", *Chem. Phys. Letters* **8**, N 1, 91-93 (1971) (Eng) (P.A. 74: 21915).
- AURICH, F. and MARQUARD, J., "High exciton densities by thermal stimulation of traps in crystalline benzene", *Chem. Phys. Letters* **11**, N 2, 167-170 (1971) (Eng) (P.A. 74: 80473).
- AZUMI, T., "Defect phosphorescence of pyrazine crystal. II. The nature of the defect", *J. Chem. Phys.* **54**, N 1, 85-91 (1971) (Eng) (P.A. 74: 16685).
- BAUGHMAN, R. H. and TURNBULL, D., "Vacancy formation parameters in organic crystals", *J. Phys. Chem. Solids* **32**, N 6, 1375-1394 (1971) (Eng).
- BELYAEVA, A. A., DUSHIN, R. B., FREDECHENSKII, Iu. B. and SHCHERBA, L. D., "Luminescence centres in crystalline perfect gases with lithium impurity atoms", *Dokl. Akad. Nauk SSSR* **199**, N 3, 628-631 (1971) (Russ).
- BIRKS, J. B., "Energy transfer in organic systems X. Pure and mixed crystals", *J. Phys.* **B3**, N 12, 1704-1714 (1970) (Eng).
- BRAUN, C. L. and WOLF, H. C., "Naphthalene triplet state interactions: concentration and polarization dependence of mixed crystal phosphorescence line shapes", *Chem. Phys. Letters* **9**, N 3, 260-262 (1971) (Eng) (P.A. 74: 45705).
- BROUDE, V. L., LEIDERMAN, A. V. and TRATAS, T. G., "Energy spectrum of isotopically mixed naphthalene crystals", *Fiz. Tverd. Tela* **13**, N 12, 3624-3632 (1971) (Russ).
- BROUDE, V. L. and LEIDERMAN, A. V., "New data on the structure of optical absorption in the region of isotopic-impurity exciton states of naphthalene crystals", *Zh. Eksp. Teor. Fiz. Pis'ma* **13**, N 8, 426-429 (1971) (Russ) (P.A. 74: 59354).
- CHAUDHURI, M. K., "Absorption spectrum of 2-naphthol acid: pure and mixed crystal", *J. Phys. C4*, N 7, 827-831 (1971) (Eng).
- CHERESON, P. H. and KOPELMAN, R., "Rovibronic spectra of naphthalene in durene and hexamethylbenzene crystals", In: 25th symposium on molecular structure and spectroscopy (abstracts), Columbus, Ohio, USA, 8-12 Sep. 1970. Columbus, Ohio, USA: Ohio State Univ. 81 (1970) (Eng) (P.A. 74: 16646).
- CHONG, T. and ITOH, N., "Vibronic transitions in radicals in irradiated naphthalene single crystals", *Mol. Cryst. and Liq. Cryst.* **11**, N 3, 315-318 (1970) (Eng) (P.A. 74: 13479).

- DAVIDSON, D. W., "The motion of guest molecules in clathrate hydrates", *Canad. J. Chem.* **49**, N 8, 1224-1242 (1971) (Eng).
- DOIGANOV, V. K. and SHEKA, E. F., "Electron absorption spectra of isotopic impurity deuterobenzene crystals", *Zh. Eksp. Teor. Fiz.* **60**, N 6, 2230-2242 (1971) (Russ) (*P.A.* **74**: 62366).
- FÜNFSCILLING, J. and ZSCHOKKE-GRÄNACHER, I., "Triplet-triplet exciton annihilation in tetracene-doped anthracene crystals", *Helv. Phys. Acta* **43**, N 8, 768-770 (1970) (Eng) (*P.A.* **74**: 21913).
- GAEVSKY, A. S., DAVYDOVA, N. A. and FAIDYSH, A. N., "Energy transfer of triplet excitation in crystals of benzophenone with diacetyl as impurity", *Opt. and Spektrosk.* **30**, N 4, 644-647 (1971) (Russ) (*P.A.* **75**: 1717).
- GRACINTOV, N. E., BURGOS, J., POPE, M. and STROM, C., "Heterofission of pentacene excited singlets in pentacene-doped tetracene crystals", *Chem. Phys. Letters* **11**, N 4, 504-508 (1971) (Eng) (*P.A.* **75**: 4136).
- GEORGE, G. A. and MORRIS, G. C., "Trapped exciton levels in single crystals of some halogenated benzenes", *J. Chem. Phys.* **54**, N 2, 815-816 (1971) (Eng) (*P.A.* **74**: 19406).
- GRAHAM, W. R. M. and DULEY, W. W., "Absorption spectra of Na isolated in solid C_6H_6 ", *J. Chem. Phys.* **54**, N 2, 586-588 (1971) (Eng).
- HOCHSTRASSER, R. M. and PRASAD, P. N., "Different spectra for different sites in mixed crystals", *Chem. Phys. Letters* **8**, N 3, 315-317 (1971) (Eng).
- HOCHSTRASSER, R. M. and MALLIARIS, A., "The luminescence of the pyrene-perylene system: evidence for mixed excimers in the solid state", *Mol. Cryst. and Liq. Cryst.* **11**, N 4, 331-342 (1970) (Eng) (*P.A.* **74**: 16682).
- HOCHSTRASSER, R. M. and PRASAD, P. N., "Some aspects of spin-lattice relaxation amongst triplet states of molecules and molecular excitons", *Chem. Phys. Letters* **9**, N 2, 113-114 (1971) (Eng).
- HOCHSTRASSER, R. M. and TIEN-SUNG LIN, "Zeeman effect of oriented molecules in solids at low temperatures", In: *Symposium on magneto-optical effects*. London, England, 11-12 Dec 1969. London, England: Faraday Soc. 100-5 (1970) (Eng) (*P.A.* **74**: 9812).
- HONG, H.-K. and ROBINSON, G. W., "Electronic states of heavily doped molecular crystals-naphthalene II. Experimental", *J. Chem. Phys.* **54**, N 3, 1369-84 (1971) (Eng).
- HONG, H.-K. and KOPELMAN, R., "Exciton superexchange, resonance pairs and exciton density of states of $^{13}B_{10}$ naphthalene", In: 25th symposium on molecular structure and spectroscopy (abstracts), Columbus, Ohio, USA, 8-12 Sep 1970. Columbus, Ohio, USA: Ohio State Univ. **81** (1970) (Eng) (*P.A.* **74**: 13052).
- HUDSON, B. and KOHLER, B., "Electronic spectroscopy of mixed crystals of diphenylotetratecene", In: 26th symposium on molecular structure and spectroscopy. Abstracts, Columbus, Ohio, USA, 14-18 Jun 1971. Columbus, Ohio, USA: Ohio State Univ., 104 (1971) (*P.A.* **75**: 10382).
- KAWABE, M., MASUDA, K. and NAMBA, S., "Electroluminescence of green light region in doped anthracene", *Jap. J. Appl. Phys.* **10**, N 4, 527-529 (1971) (Eng).
- KAWABE, M., MASUDA, K. and NAMBA, S., "Saturation of the fluorescence of tetracene in anthracene crystal", *Chem. Phys. Letters* **8**, N 5, 448-450 (1971) (Eng).
- KHACHATURIAN, A. G. and ESTRIN, Yu. Z., "On local and quasiloal relaxation processes in crystals with impurities", *Zh. Eksp. Teor. Fiz.* **61**, N 6, 2607-2614 (1971) (Russ).
- KITAIGORODSKIY, A. I. and YAEUSHEVICH, L. V., "Approximate method of calculation of solubility limit value in solid state for organic substances", *Fiz. Tverd. Tela* **13**, N 8, 2386-2391 (1971) (Russ).
- KLIMUSHEVA, G. V. and YAREMKO, R. V., "On the exciton states of some pure and mixed molecular crystals. I. Absorption spectra of *p*-dichloro-, *p*-dibromo- and *p*-chlorobromobenzene crystals", *Opt. and Spektrosk.* **31**, N 2, 243-248 (1971) (Russ).
- KURMEY, N. D. and SHPAK, M. T., "Energy migration between impurity centres in naphthalene crystal", In: Proceedings of the first All-Union seminar on energy transfer in condensed media. Lori, Armenia 6-12 Oct 1969. Erevan 155-159 (1970) (Russ).
- LEGLER, R., "Fluorescence studies of anthracene doped single crystals of phenanthrene, fluorine 2,3-dimethylnaphthalene and *p*-terphenyl", *Z. Naturforsch.* **26a**, N 6, 988-997 (1971) (Ger) (*P.A.* **74**: 56252).
- LEVANON, H., "Localization of triplet exciton in debenzoylmethane chelates", *Chem. Phys. Letters* **9**, N 3, 257-259 (1971) (Eng).
- LEVANON, H. and WEISSMAN, S. I., "Transient effects in excitation of triplet states", *J. Amer. Chem. Soc.* **93**, N 17, 4309-4310 (1971) (Eng).
- LUSHCHENKO, E. L., PODOLSKAYA, T. I. and ROZENSHTEIN, L. D., "Local states in organic dyes (pinacyanol)", *Fiz. Tverd. Poluprov.* **5**, N 2, 339-341 (1971) (Russ).
- MALYKHINA, N. N., KURMEY, N. D. and VAL'DMAN, M. M., "Spectral properties of β -F-naphthalene doped with α -Cl-naphthalene", *Zh. Prikl. Spektrosk.* **14**, N 4, 724-727 (1971) (Russ) (*P.A.* **74**: 51512).
- MCALPINE, R. D., "Close lying n, π states: mixed crystal spectra of 2,2'- and 4,4'-bipyridyl", *J. Mol. Spectrosc.* **38**, N 3, 441-448 (1971) (Eng).
- MEL'NIK, V. I., FUCHKOVSAYA, G. A., KHARCHENKO, N. P. and SHPAK, M. T., "Effect of ultraviolet irradiation on electronic and vibration spectra of benzophenone", *Opt. and Spektrosk.* **31**, N 2, 190-194 (1971) (Russ).
- MISPELTER, J., GRIVET, J.-Ph. and LHOSTE, J.-M., "Electron spin resonance of phosphorescent fluorine-substituted aromatics I. 1-fluoronaphthalene and 2-fluoronaphthalene in durene single crystals", *Mol. Phys.* **21**, N 6, 999-1013 (1971) (Eng).
- MORRIS, B. and DAVIDSON, D. W., "A clathrate hydrate of cyclobutanone: dielectric relaxation of the host and guest molecules", *Canad. J. Chem.* **49**, N 8, 1243-1251 (1971) (Eng).
- PERETTI, P., RANSON, P. and ROUSSET, Y., "Phosphorescence of benzophenone and mixed benzophenone-naphthalene crystals due to two-photon nonlinear absorption", *C. R. Acad. Sci., Paris* **273B**, N 5, 251-254 (1971) (Fr).
- PERSONOV, R. I. and BYKHOVSKAIA, L. A., "On polarization of multiplet components in Shpol'skii's spectra", *Dokl. Akad. Nauk SSSR* **199**, N 2, 299-302 (1971) (Russ).
- PERSONOV, R. I., GODYAEV, E. D. and KOROTAEV, O. N., "On the line shape in luminescence quasi-linear spectra of organic molecules at 4.2°K", *Fiz. Tverd. Tela* **13**, N 11, 111-116 (1971) (Russ).
- PERSONOV, R. I., OSADKO, I. S., GODYAEV, E. D. and AL'SHITS, E. I., "Study of phonon wings and phonon-free lines in spectra of *n*-paraffin impurity crystals", *Fiz. Tverd. Tela* **13**, N 9, 2653-2663 (1971) (Russ) (*P.A.* **75**: 1715).

- POWELL, R. C. and KEPLER, R. G., "Energy transfer in doped organic crystals", *Mol. Cryst. and Liq. Cryst.* 11, N 4, 349-360 (1970) (Eng) (P.A. 74: 16675).
- POWELL, R. C., "Energy transfer in anthracene- and tetracene-doped naphthalene crystals", *Phys. Rev. B4*, N 2, 628-635 (1971) (Eng) (P.A. 74: 53290).
- RINGEL, H., DAMASK, A. C., ARNDT, R. A. and WHITTEN, W. B., "Annealing of the 6060 Å color center in gamma-irradiated anthracene", *Mol. Cryst. and Liq. Cryst.* 14, N 1-2, 63-70 (1971) (Eng).
- ROUSSET, Y. and SANCEY, J., "Triplet-triplet transfer in benzophenone-naphthalene crystalline mixtures", *J. Chim. Phys. phys.-chim. biol.* 67, N 11-12, 1922-1927 (1970) (Fr) (P.A. 74: 21912).
- SAPOZHNIKOV, M. N., "Thermal broadening and shift of phonon-free lines in quasi-linear spectra of impurity organic crystals", *Fiz. Tverd. Tela* 13, N 9, 2527-2534 (1971) (Russ).
- SHEKA, E. F. and TERENETSKAYA, I. P., "Vibronic spectra of mixed naphthalene-octadecateronaphthalene crystals and impurity exciton states", *Fiz. Tverd. Tela* 13, N 4, 1071-1078 (1971) (Russ) (P.A. 74: 45660).
- SOKOLOV, I. V. and TRIFONOV, E. D., "Interference narrowing of hot luminescence lines of an impure crystal", *Opt. and Spektrosk.* 30, N 4, 730-733 (1971) (Russ) (P.A. 75: 1450).
- VARIASHKIN, P. G., "Positron annihilation and positronium bubbles in liquid and solid argon, krypton, and xenon", *Phys. Rev. A3*, N 4, 1230-1232 (1971) (Eng).
- VAUBEL, G., "Intersystem crossing between guest and host molecules in anthracene mixed crystals", *Chem. Phys. Letters* 9, N 1, 51-53 (1971) (Eng).
- ZHEVANDROV, N. D. and IL'INYKH, T. V., "Study of efficiency of energy transfer from matrix to impurity in mixed molecular crystals", *Zh. Prikl. Spektrosk.* 16, N 6, 1041-1045 (1971) (Russ).

7. Exciton Problem of Molecular Crystals

7.1. Lattice Dynamics and Phonon Spectra

- AGRAVNOVICH, V. M. and LALOV, I. I., "Biphonons, Fermi resonance and polariton effects in the theory of Raman scattering in crystals", *Zh. Eksp. Teor. Fiz.* 61, N 2, 656-666 (1971) (Russ) (P.A. 74: 73967).
- AGRAVNOVICH, V. M. and LALOV, I. I., "Fermi resonance in molecular crystals", *Fiz. Tverd. Tela* 13, N 4, 1032-1043 (1971) (Russ) (P.A. 74: 45007).
- AGRAVNOVICH, V. M. and MEKHTIEV, M. A., "Fermi-resonance on plasmons", *Fiz. Tverd. Tela* 13, N 8, 2424-2430 (1971) (Russ).
- ALFANO, R. R. and SHAPIRO, S. L., "Optical phonon lifetime measured directly with picosecond pulses", In: *Phonons*. Université de Rennes. July 26-29 1971. Abstracts. p.D 3/1.
- BAILEY, R. T., "Molecular motion in organic crystals", In: 2nd international conference on Raman spectroscopy (abstracts), Oxford, England, 13-17 Sep 1970. Bradford, Yorks, England: Univ. Bradford (1970) (Eng) (P.A. 74: 41603).
- BAILEY, R. T., "Spectroscopic and thermodynamic studies of molecular crystals. I. The internal vibrations of adamantane in the plastic phase", *Spectrochim. Acta* 27A, N 8, 1447-1453 (1971) (Eng) (P.A. 74: 57895).
- BAERENTZEN, H., SCHRADER, B. and MERTEN, L., "Optical properties of lattice vibrations in molecular crystals", *Phys. Stat. Sol.(b)* 45, N 2, 505-514 (1971) (Eng) (P.A. 74: 53188).
- BAERENTZEN, H., "Vibrational excitons and polaritons in molecular crystals", *J. Chem. Phys.* 55, N 8, 3664-3668 (1971) (Eng).
- BATLEY, M., JOHNSTON, L. J. and LYONS, L. E., "Polarization energies of molecular crystals", *Aust. J. Chem.* 23, N 12, 2397-2402 (1970) (Eng).
- BERTIE, J. E. and KOPELMAN, R., "On the unit cell group and factor group in the theory of the electronic and vibrational spectra of crystals", *J. Chem. Phys.* 55, N 7, 3613 (1971) (Eng).
- BLECKMANN, P., BAERENTZEN, H., MEIER, W. and SCHRADER, B., "Calculation of frequencies and intensities of internal and external vibrations in molecular crystals", In: 2nd international conference on Raman spectroscopy (abstracts), Oxford, England, 13-17 Sep 1970. Bradford, Yorks, England: Univ. Bradford (1970) (Eng) (P.A. 74: 41581).
- BOHM, E. and YARIS, E., "Van der Waals forces including exchange in the small overlap region", *J. Chem. Phys.* 55, N 6, 2620-2629 (1971) (Eng).
- BOISIAKOV, A. I., MIKHAILOV, A. I. and GOL'DANSKII, V. I., "Molecular mobility in organic crystals as investigated by the paramagnetic probe method", *Dokl. Akad. Nauk SSSR* 198, N 6, 1356-1359 (1971) (Russ).
- BUERGER, M. J., "Phase transformations", *Kristallografiya* 16, N 6, 1084-1096 (1971) (Russ).
- CHATTERJEE, S. D. and ROYCHOWDHURY, K. D., "After-effect of a magnetic field on the dielectric constant of solidified nitrobenzene", *Phys. Stat. Sol.(a)* 2, N 2, K121-4 (1970) (Eng).
- COLLES, M. J. and GORDMAINE, J. A., "Generation and detection of large-K-vector phonons", *Phys. Rev. Letters* 27, N 10, 670-674 (1971) (Eng).
- EGGERT, E. and HANSEL, H., "Characteristic Debye temperature of anthracene", *Phys. Stat. Sol.(b)* 47, N 1, K69-73 (1971) (Eng).
- FALTER, C. and LUDWIG, W., "Symmetry-relations and dynamics of molecular crystals in the long wave limit", *Z. Phys.* 242, N 3, 276-286 (1971) (Eng).
- FROCH, R. and DECIUS, J. C., "Dipolar coupling and molecular vibrations in crystals. IV. Frequency shifts and dipole moment derivatives", *J. Chem. Phys.* 54, N 6, 2374-2379 (1971) (Eng).
- GANAS, P. S., "Scattering by a van der Waals force in the Born approximation", *Phys. Rev. A4*, N 6, 2224-2226 (1971) (Eng).
- GUPTA, N. P. and DAVE, A. K., "Lattice vibrations of rare gas crystals by Morse potential", *Ann. Phys.* 57, N 2, 386-400 (1971) (Eng).
- IOSILEVSKII, Ya. A., "On the construction of the dynamic Green's function for a finite crystal", *Kristallografiya* 16, N 2, 279-285 (1971) (Russ).
- IVANOV, E. N., "Nuclear magnetic relaxation and random reorientations in molecular crystals", *Phys. Stat. Sol.* 42, N 1, 453-458 (1970) (Eng) (P.A. 74: 9992).
- KATS, E. I., "Van der Waals forces in nonisotropic systems", *Zh. Eksp. Teor. Fiz.* 60, N 3, 1172-1177 (1971) (Russ).
- KITAIGORODSKII, A. I. and YAKUSHEVICH, L. V., "Approximate method of calculation of solubility limit value in solid state for organic substances", *Fiz. Tverd. Tela* 13, N 8, 2386-2391 (1971) (Russ).

- KITAIGORODSKII, A. I. and MUKHTAROV, E. I., "Calculation of small-vibration spectra for molecular crystals", *Opt. and Spektrosk.* **31**, N 5, 706-710 (1971) (Russ).
- KITAIGORODSKII, A. I. and MYASNIKOVA, R. M., "Symmetry relationships in the structures of solid solutions of molecular substances", *Kristallografiya* **16**, N 6, 1253-1258 (1971) (Russ).
- LANGHOFF, P. W., "Sum-rule moment bounds on long-range van der Waals potentials", *Chem. Phys. Letters* **12**, N 2, 217-222 (1971) (Eng).
- MAVROYANNIS, C., "Dynamics of interacting photon-phonon fields in dielectric crystals", *Phys. Rev.* **B3**, N 8, 2750-2762 (1971) (Eng) (P.A. **74**: 33945).
- OOYAMA, N. and SAITÔ, N., "On the stability of lattice solutions", *Progr. Theor. Phys. Suppl.* **N 45**, 201-208 (1970) (Eng) (P.A. **74**: 38447).
- PAWLEY, G. S., "An extended rigid-body model for molecular crystals", *Acta Cryst.* **A27**, N 1, 80-81 (1971) (Eng) (P.A. **74**: 26121).
- PAWLEY, G. S., REYNOLDS, P. A., KJEMS, J. K. and WHITE, J. W., "A model calculation of the inelastic neutron scattering spectra from polycrystalline naphthalene", *Solid State Commun.* **9**, N 16, 1353-1357 (1971) (Eng).
- RAICH, J. C. and ETTERS, R. D., "Soft modes in molecular crystals", *J. Chem. Phys.* **55**, N 8, 3901-3909 (1971) (Eng) (P.A. **74**: 80013).
- ROWELL, J. M. and DYNES, R. C., "Comparison of phonon spectra determined from tunneling experiments and neutron scattering", In: *Phonons*. Université de Rennes. July 26-29 1971. Abstracts. p. C5/1.
- RUVALDS, J., TUTTO, I. and ZAWADOWSKI, A., "Bound phonon pairs in solids", In: *Phonons*. Université de Rennes. July 26-29 1971. Abstracts. p. J4/1.
- SINEVICH, E. A., PERTSOV, N. V. and SHCHUKIN, E. D., "Polycrystalline naphthalene strength decrease in adsorption of surface-active substances from aqueous solutions", *Dokl. Akad. Nauk SSSR* **197**, N 6, 1376-1379 (1971) (Russ).
- SLYSAREV, V. A. and FREIMAN, YU. A., "Thermal properties of molecular crystals", *Fiz. Tverd. Tela* **13**, N 2, 646-647 (1971) (Russ).
- TAKENO, S., "The anharmonic vibrational properties of phonon impurity modes in solids", In: *Phonons*. Université de Rennes. July 26-29 1971. Abstracts. p. J5/1.
- TAKENO, S., "A theory of the lattice vibration of anharmonic solids", *Progr. Theor. Phys. Suppl.* **N 45**, 137-173 (1970) (Eng) (P.A. **74**: 36754).
- THOMPSON, B. V., "A note on the theory of Brillouin scattering in molecular crystals", *J. Phys.* **C4**, N 3, L61-L63 (1971) (Eng) (P.A. **74**: 37597).
- VAN KRANENDONK, J., "Localized excitations in solid hydrogen", In: Proceedings of the 1st international conference on localized excitations in solids, Irvine, Calif., USA, 18-22 Sept 1967. London, England: Plenum 713-720 (1968) (Eng) (P.A. **74**: 16227).
- VARMA, C. M., "Propagation of heat in solids as solitons", In: *Phonons*. Université de Rennes. July 26-29 1971. Abstracts. p. D2/1.
- VENKATARAMAN, G. and SAHNI, V. C., "External vibrations in complex crystals", *Rev. Mod. Phys.* **42**, N 4, 409-470 (1970) (Eng) (P.A. **74**: 2217).
- ### 7.2. Singlet Excitons and Cooperative Effects
- AGARWAL, G. S., PATTANAYAK, D. N. and WOLF, E., "Boundary conditions on exciton polarization and mode coupling in a spatially dispersive medium", *Optics Commun.* **4**, N 4, 260-263 (1971) (Eng).
- AGRAHOVICH, V. M. and MEKHTEV, M. A., "Spectra of organic molecules incorporated into metal matrix and exciton mechanism of high-temperature superconductivity", *Fiz. Tverd. Tela* **13**, N 9, 2732-2742 (1971) (Russ) (P.A. **75**: 1658).
- ALIKHANOVA, Z. M., ZOLIN, V. F., ROZMAN, S. I., FISHER, P. S. and ELLERT, G. V., "On the mechanism of reveal of internal vibrations of ligands in luminescence spectra of uranyl compounds", *Opt. and Spektrosk.* **31**, N 2, 325-327 (1971) (Russ).
- ASAF, U. and STEINBERGER, I. T., "Wannier excitons in liquid-xenon", *Phys. Letters* **34A**, N 4, 207-208 (1971) (Eng).
- BABENKO, S. D., BENDERSKII, V. A., GOL'DANSKII, V. I., LAVRUSHKO, A. G. and TYCHINSKII, V. P., "Singlet exciton annihilation in anthracene crystals", *Phys. Stat. Sol.(b)* **45**, N 1, 91-97 (1971) (Eng).
- BERTIE, J. E. and KOPELMAN, R., "On the unit cell group and factor group in the theory of the electronic and vibrational spectra of crystals", *J. Chem. Phys.* **55**, N 7, 3613 (1971) (Eng).
- BRODIN, M. S., DUDINSKY, M. A. and MARISOVA, S. V., "Spectral evidence of surface states in the anthracene crystal", *Opt. and Spektrosk.* **31**, N 5, 749-754 (1971) (Russ).
- COWLEY, J. M. and KUWABARA, S., "Information on excited states of crystals from inelastic electron diffraction intensities", *Phys. Letters* **34A**, N 2, 135-136 (1971) (Eng) (P.A. **74**: 33531).
- CRAGG, D. P. and DISSADO, L. A., "Absorption and fluorescence by thin molecular crystals. I. Theory", *Proc. Roy. Soc. London* **325A**, N 1560, 1-21 (1971) (Eng) (P.A. **74**: 80412).
- DISSADO, L. A., "Absorption intensities of molecular crystals", *J. Phys.* **C4**, N 13, 1874-1884 (1971) (Eng).
- DORAN, N. J. and HARPER, P. G., "Numerical behaviour of transmission and derivative traces due to direct electronic transitions near Van Hove singularities", *Phys. Stat. Sol.(b)* **48**, N 1, 223-230 (1971) (Eng).
- FEOFILOV, P. P., "Combinational luminescence of $\text{EuAlO}_3 - \text{Mn}^{++}$ ", *Opt. and Spektrosk.* **31**, N 5, 849-850 (1971) (Russ).
- GADOMSKII, O. N. and SAMARTSEV, V. V., "Exciton induction and echo", *Fiz. Tverd. Tela* **13**, N 9, 2806-2808 (1971) (Russ) (P.A. **75**: 1705).
- GOIKHMAN, A. YU., "Admixture of excitons in inert gas crystals", *Vestn. Mosk. Univ. Fiz. Astron.* **N 3**, 335-336 (1971) (Russ) (P.A. **74**: 69476).
- HANSON, D. M., "The nature of energy delocalization in molecular crystals", *Chem. Phys. Letters* **11**, N 2, 175-178 (1971) (Eng).
- HONG, H.-K. and KOPELMAN, R., "Exciton superexchange, resonance pairs and exciton density of states of $^1\text{B}_{2u}$ naphthalene", In: 25th symposium on molecular structure and spectroscopy (abstracts). Columbus, Ohio, USA, 8-12 Sep 1970 (Columbus, Ohio, USA: Ohio State Univ. 81 (1970) (Eng) (P.A. **74**: 13052).
- HONG, H.-K. and KOPELMAN, R., "Exciton superexchange, resonance pairs, and complete exciton band structure of $^1\text{B}_{2u}$ naphthalene", *J. Chem. Phys.* **55**, N 2, 724-745 (1971) (Eng) (P.A. **74**: 69471).

- IVLIEV, Yu. A., "Energy cumulation probability and efficiency of cooperative luminescence for impurity atom triplets in crystals", *Opt. and Spektrosk.* **30**, N 4, 721-729 (1971) (Russ) (P.A. 75: 1449).
- JEROME, D., RIBUX, M. and FRIEDEL, J., "Low-temperature resistivity in nearly excitonic systems", *Phil. Mag.* **23**, N 185, 1061-1075 (1971) (Eng) (P.A. 74: 45107).
- KALLMANN, H., VAUBEL, G. and BAESSLER, H., "Interaction of singlet excitons in organic materials with an absorbing surface", *Phys. Stat. Sol.(b)* **44**, N 2, 813-820 (1971) (Eng) (P.A. 74: 41640).
- KANER, E. A. and FELDMAN, E. P., "Dislocation bands in electron energy spectrum", *Zh. Eksp. Teor. Fiz.* **61**, N 1, 419-432 (1971) (Russ).
- KILLESREITER, H. and BAESSLER, H., "Exciton reaction at an anthracene/metal interface: charge transfer", *Chem. Phys. Letters* **11**, N 4, 411-414 (1971) (Eng) (P.A. 75: 3490).
- KLEIN, D. J. and SOOS, Z. G., "Site representation for charge transfer excitations in molecular crystals", *Mol. Phys.* **20**, N 6, 1013-1024 (1971) (Eng).
- KOLB, H. and WOLF, H. C., "NMR studies of exciton motion in molecular crystals", In: Abstracts of the 4th international symposium on magnetic resonance, Rehovot, Israel and Jerusalem, Israel, 25-27 Aug (1971) and 30-31 Aug 1971. Rehovot, Israel: Weizmann Inst. Sci. (1971) (P.A. 75: 7132).
- KURIK, M. V. and PRIVATINSKII, Yu. P., "Diffusion length of singlet exciton in anthracene single crystals", *Fiz. Tverd. Tela* **13**, N 10, 2877-2882 (1971) (Russ) (P.A. 75: 6737).
- LIPARI, N. O., KUNZ, A. B. and BEALL FOWLER, W., "Electron energy bands in solid rare gases", *Phys. Stat. Sol.(b)* **45**, N 1, K43-K45 (1971) (Eng) (P.A. 74: 52725).
- MARTIN, M., "Exciton self-trapping in rare-gas crystals", *J. Chem. Phys.* **54**, N 8, 3289-3299 (1971) (Eng) (P.A. 74: 33549).
- MIKHAILOV, I. D. and KOLESNIKOV, A. P., "Band structure of polymer crystals with branched con-junction system", *Fiz. Tverd. Tela* **13**, N 4, 945-950 (1971) (Russ).
- ONODERA, Y., "Interference of an exciton with the continuum absorption caused by the electron-hole exchange interaction", *Phys. Rev. B4*, N 8, 2751-2757 (1971) (Eng).
- OSTAPENKO, N. I., SUGAKOV, V. I. and SHPAK, M. T., "Local excitons and exciton band structure in naphthalene", *Phys. Stat. Sol.(b)* **45**, N 2, 729-733 (1971) (Eng) (P.A. 74: 58867).
- OVSYANKIN, V. V. and FEOFILOV, P. P., "Cooperative luminescence of barium and yttrium fluorides activated with ytterbium and holmium", *Opt. and Spektrosk.* **31**, N 6, 944-943 (1971) (Russ).
- OVSYANKIN, V. V. and FEOFILOV, P. P., "Two-quantum cooperative transformation of frequency of weak light flow", *Zh. Eksp. Teor. Fiz. Pis'ma* **14**, N 10, 548-551 (1971) (Russ).
- PETER, L. and VAUBEL, G., "Charge carrier-exciton interaction in crystalline tetracene", *Phys. Stat. Sol.(b)* **48**, N 2, 587-590 (1971) (Eng) (P.A. 75: 10446).
- PHILPOTT, M. R., "Approximate form for lattice sums of exciton resonance interactions arising from intense molecular transitions", *Chem. Phys. Letters* **8**, N 6, 477-478 (1971) (Eng).
- PHILPOTT, M. R., "Calculation of the exciton band structure of the 3800 and 2500 Å singlet transitions of crystalline anthracene", *J. Chem. Phys.* **54**, N 1, 111-113 (1971) (Eng).
- PHILPOTT, M. R., "Exciton theory of the electronic states of dye-polymer complexes. II. Stationary states of helical complexes", *J. Chem. Phys.* **54**, N 10, 4223-4224 (1971) (Eng).
- PHILPOTT, M. R., "Exciton theory of the electronic states of dye-polymer complexes. III. Configurationally induced optical rotatory dispersion of dye transitions in helical complexes", *J. Chem. Phys.* **55**, N 8, 4005-4011 (1971) (Eng).
- POPE, M., "Kinetics of exciton interactions in molecular crystals", In: Conference on scintillator and liquid scintillation counting, San Francisco, Calif., USA, 7-10 July 1970. San Francisco, Calif., USA: Univ. Calif., San Francisco (1970) (Eng) (P.A. 74: 8097).
- POPE, M., BURGOS, J. and WOTHERSPOON, N., "Singlet exciton-trapped carrier interaction in anthracene", *Chem. Phys. Letters* **12**, N 1, 140-143 (1971) (Eng).
- SCHROEDER, J. and SILBERY, R., "Density of states of the first vibronic exciton band in anthracene", *J. Chem. Phys.* **55**, N 11, 5418-5419 (1971) (Eng).
- SOOS, Z. G. and STREIBEL, P. J., "Charge-transfer integral in paramagnetic π molecular crystals", *J. Amer. Chem. Soc.* **93**, N 14, 3325-3327 (1971) (Eng).
- STEINBERGER, I. T. and ASAF, U., "Free Wannier excitons in solid and liquid xenon", In: 2nd International conference on conduction in low mobility materials, Eliat, Israel, 5-8 Apr 1971. London, England: Taylor and Francis, 453-460 (1971) (P.A. 75: 10351).
- SUMI, H., "The scattering theory for the metamorphism of Van Hove singularities in the optical spectra of solids", *Techn. Rept. ISSP A* **N 416** (1970) (Eng).
- SWORAKOWSKI, J., "On the energy gap in anthracene (comment on the paper of Y. Ishihara and I. Nakada)", *J. Phys. Soc. Japan* **29**, N 5, 1390 (1970) (Eng) (P.A. 74: 19018).
- TAKAHASHI, Y. and TOMURA, M., "Diffusion of singlet excitons in anthracene crystals", *J. Phys. Soc. Japan* **31**, N 4, 1100-1108 (1971) (Eng) (P.A. 74: 77011).
- TOMKIEWICZ, Y., GROFF, R. P. and AVAKIAN, P., "Spectroscopic approach to energetics of exciton fission and fusion in tetracene crystals", *J. Chem. Phys.* **54**, N 10, 4504-4507 (1971) (Eng) (P.A. 74: 45704).
- TOYOZAWA, Y., "New aspects of excitons", In: Proceedings of the 10th international conference on the physics of semiconductors. Cambridge, Mass., USA, 17-21 Aug 1970. Washington, D.C., USA: US Atomic Energy Commission 5-13 (1970) (Eng) (P.A. 74: 52741).
- VAUBEL, G. and BAESSLER, H., "Diffusion of singlet excitons in tetracene crystals", *Mol. Cryst. and Liq. Cryst.* **12**, N 1, 47-56 (1970) (Eng) (P.A. 74: 21917).
- VAUBEL, G., BAESSLER, H. and MÖBIUS, D., "Reaction of singlet excitons at an anthracene/metal interface: energy transfer", *Chem. Phys. Letters* **10**, N 3, 334-336 (1971) (Eng).
- VERBER, C. M., GRIESER, D. R. and JONES, W. H., Jr., "Cooperative and sequential excitation of red fluorescence of Ho^{3+} in CaF_2 ", *J. Appl. Phys.* **42**, N 7, 2767-2769 (1971) (Eng) (P.A. 74: 49625).
- WAKAYAMA, N. and WILLIAMS, D. F., "Singlet exciton-charge carrier interaction in anthracene", *Chem. Phys. Letters* **9**, N 1, 45-47 (1971) (Eng) (P.A. 74: 36905).
- WILLIAMS, D. R. and SHAPIRO, R. C., "Exchange interactions in crystalline aromatic hydrocarbons", *J. Chem. Phys.* **54**, N 11, 4838-4841 (1971) (Eng).
- YEPEMOV, N. A. and KOZHUSHNER, M. A., "The theory of exciton-exciton scattering", *Fiz. Tverd. Tela* **13**, N 12, 3541-3550 (1971) (Russ).

7.3. Triplet Excitons

- ARNOLD, S., WHITTEN, W. B. and DAMASK, A. C., "Davydov splitting and band structure for triplet excitons in pyrene", *Phys. Rev. B3*, N 10, 3452-3457 (1971) (Eng) (P.A. 74: 37633).

- DREW, M. and WILLIAMS, D. F., "Comment concerning the diffusion coefficient of triplet excitons in anthracene", *J. Chem. Phys.* **54**, N 4, 1844-1845 (1971) (Eng) (P.A. 74: 58862).
- ERN, V. and MCGHIE, A. R., "Quenching of triplet excitons in anthracene crystals by internal beta-irradiation", *Mol. Cryst. and Liq. Cryst.* **15**, N 3, 277-282 (1971) (Eng) (P.A. 75: 6736).
- ERN, V., BOUCHRIHA, H., FOURNY, J. and DELACOTE, G., "Triplet exciton-trapped hole interaction in anthracene crystals", *Solid State Commun.* **9**, N 14, 1201-1203 (1971) (Eng).
- FRANCIS, A. H. and HARRIS, C. B., "Coherent triplet exciton trapping in molecular crystals", *J. Chem. Phys.* **55**, N 7, 3595-3596 (1971) (Eng).
- FRANCIS, A. H. and HARRIS, C. B., "The observation of coherent triplet excitons and density of states functions in molecular crystals", *Chem. Phys. Letters* **9**, N 3, 188-193 (1971) (Eng) (P.S. 74: 40888).
- FRANCIS, A. H. and HARRIS, C. B., "The relationship between microwave spectroscopy, coherent triplet excitons, and density of states functions in molecular crystals", *Chem. Phys. Letters* **9**, N 3, 181-187 (1971) (Eng).
- GAIDIDEI, Yu. B. and PETROV, E. G., "On the double triplet excitations in molecular crystals", *Phys. Stat. Sol.* **42**, N 1, K71-K73 (1970) (Eng) (P.A. 74: 9835).
- GOODE, D. H., "Effect of triplet exciton trap saturation and bimolecular decay on the delayed fluorescence of anthracene", In: *Molecular luminescence. An international conference*. New York-Amsterdam 751-763 (1969) (Eng).
- HOCHSTRASSER, R. M., WHITEMAN, J. D. and WIERSMA, D. A., "Magnetic field effects on exciton interactions in linear chains", In: 25th symposium on molecular structure and spectroscopy (abstracts), Columbus, Ohio, USA, 8-12 Sep 1970. Columbus, Ohio, USA: Ohio State Univ. 45 (1970) (Eng) (P.A. 74: 9312).
- HOESTERY, D. C. and ROBINSON, G. W., "On the diffusion coefficient of triplet excitons in anthracene", *J. Chem. Phys.* **54**, N 4, 1709-1712 (1971) (Eng) (P.A. 74: 30748).
- KALLMANN, H., "Production and annihilation of triplet excitons in organic materials near absorbing surfaces", *Z. Naturforsch.* **26a**, N 5, 799-802 (1971) (Eng).
- KHOLMOGOROV, V. E., "Excitonic nature of the ESR signal in complexes of crystalline chlorophyll with electron acceptors", *Dokl. Akad. Nauk SSSR* **200**, N 2, 402-405 (1971) (Russ).
- LAVANON, H., "Localization of triplet exciton in dibenzoylmethane chelates", *Chem. Phys. Letters* **9**, N 3, 257-259 (1971) (Eng).
- LAVRUSHKO, A. G. and BENDERSEKIL, V. A., "Triplet-triplet annihilation and photoconductivity of anthracene crystals", *Fiz. Tverd. Tela* **13**, N 1, 284-286 (1971) (Russ) (P.A. 74: 37630).
- MURAO, T., "Magnetic properties of a system with crystal-field singlet ground state", In: Proceedings of the twelfth international conference on low temperature physics. Kyoto Japan, Sep 4-10, 1970, Academic Press of Japan 693-695 (1971) (Eng).
- NICKEL, B. and MAXDORF, H., "A new method for the determination of the diffusion coefficient of triplet excitons in the c-direction of crystalline anthracene", *Chem. Phys. Letters* **9**, N 6, 555-558 (1971) (Eng).
- SHARNOFF, M. and ITURBE, E. B., "Spin memory in the trapping of triplet excitons", *Phys. Rev. Letters* **27**, N 9, 576-579 (1971) (Eng) (P.A. 74: 69479).
- TIBERGHIEN, A. and DELACOTE, G., "Charge transfer and triplet exciton integrals in aromatic crystals. Naphthalene and anthracene", *J. Phys.* **31**, N 7, 637-656 (1970) (Fr) (P.A. 74: 5865).
- TIBERGHIEN, A. and DELACOTE, G., "Evaluation of the crystalline tetracene triplet Davydov splitting", *Chem. Phys. Letters* **8**, N 1, 88-90 (1971) (Eng) (P.A. 74: 21876).
- WHITEMAN, J. D. and HOCHSTRASSER, R. M., "Triplet excitons in linear chains", In: Conference on scintillator and liquid scintillation counting, San Francisco, Calif., USA, 7-10 July 1970. San Francisco, Calif., USA: Univ. Calif., San Francisco (1970) (Eng) (P.A. 74: 9311).
- 7.4. Exciton-phonon Interaction (shape of bands, energy dissipation, vibronic spectra)**
- AGRANOVICH, V. M. and GINZBURG, V. L., "Theory of combinational scattering of light involving polaritons (real excitons)", *Zh. Eksp. Teor. Fiz.* **61**, N 3, 1243-1253 (1971) (Russ).
- BARENTZEN, H., "Vibrational excitons and polaritons in molecular crystals", *J. Chem. Phys.* **55**, N 8, 3664-3668 (1971) (Eng).
- BENDOW, B., "Polariton theory of Raman scattering. III. Effect of exciton and band properties on the frequency dependence of the cross section", *Phys. Rev.* **B4**, N 2, 552-562 (1971) (Eng).
- BENDOW, B., "Theory of indirect excitation of sound by light", *Phys. Rev.* **B4**, N 10, 3489-3497 (1971) (Eng) (P.A. 74: 83179).
- CHO, K. and TOYOZAWA, Y., "Exciton-phonon interaction and optical spectra-self-trapping, zero-phonon line and phonon sidebands", *J. Phys. Soc. Japan* **30**, N 6, 1555-1574 (1971) (Eng) (P.A. 74: 49536).
- DAYDOV, A. S. and SERIKOV, A. A., "Vibronic spectra of molecular crystals under totally symmetric vibrations", *Phys. Stat. Sol.(b)* **44**, N 1, 127-138 (1971) (Eng) (P.A. 74: 36752).
- DE MARTINI, F., "Infrared generation by coherent excitation of polaritons", *Phys. Rev.* **B4**, N 12, 4556-4578 (1971) (Eng).
- EDELSTEIN, V. M., "On the theory of coupled polaron", *Fiz. Tverd. Tela* **13**, N 10, 3005-3008 (1971) (Russ).
- JONES, G. and BRENNER, J. L., "Asymmetric line shape of excitons localized in thin crystals", *J. Phys. C4*, N 8, L137-L139 (1971) (Eng) (P.A. 74: 52739).
- KRISTOFFEL, N. N. and KONSIN, P. I., "Theory of vibronic phase transitions in wide-gap ferroelectrics", *Fiz. Tverd. Tela* **13**, N 9, 2513-2520 (1971) (Russ) (P.A. 74: 80012).
- KURIK, M. V., "Urbach rule", *Phys. Stat. Sol.(a)* **8**, N 1, 9-45 (1971) (Eng) (P.A. 75: 4453).
- LEVINSON, Y. B., MATULIS, A. Yu. and SUCHERBAKOV, L. M., "Polaron spectrum in a magnetic field. Bound electron-phonon states", *Zh. Eksp. Teor. Fiz.* **61**, N 2, 843-858 (1971) (Russ).
- LUBCHENKO, A. F. and FISHUK, I. I., "Urbach's rule with the dispersion of frequencies", *Phys. Stat. Sol.(b)* **48**, N 1, K11-K14 (1971) (Eng) (P.A. 75: 4452).
- LUKASHIN, A. V., "On the theory of vibronic interactions in polymers", *Opt. and Spektrosk.* **30**, N 5, 877-881 (1971) (Russ).
- MANEVAL, J. P., ZYLBERSTEJN, A. and HUET, D., "Direct observation of electron-phonon interaction", *Phys. Rev. Letters* **27**, N 20, 1375-1377 (1971) (Eng).
- MİYAKAWA, T. and DEXTER, D. L., "Phonon sidebands, multiphonon relaxation of excited states, and phonon-assisted energy transfer between ions in solids", *Phys. Rev.* **B1**, N 7, 2961-2969 (1970) (Eng).

- MORRIS, G. C. and SCEATS, M. G., "Exciton dynamics in strongly coupled molecular crystal systems", In: 8th Australian spectroscopy conference. Abstracts, Clayton, Australia, 16-20 Aug 1971. Clayton, Australia: Monash University (1971) (P.A. 75: 9942).
- MUNN, R. W. and SIEBRAND, W., "Theory of electron-phonon interactions in organic crystals", *Disc. Faraday Soc.* N 51, 17-23 (1971) (Eng).
- MUROMTSEV, V. I., POMORTSEV, V. V., SAFRONOV, S. N., GOLIKOV, V. P., KLINSHPONT, E. R., MILINCHUK, V. K. and ZHIDOMIROV, G. M., "On the role of electron-nuclear interactions in EPR relaxation in the solid phase", *Fiz. Tverd. Tela* 13, N 4, 1062-1065 (1971) (Russ).
- NITSOVICH, B. M. and YEREMKO, A. A., "Light exciton-phonon absorption by molecular crystals", *Ukr. Fiz. Zh.* 16, N 5, 799-807 (1971) (Russ) (P.A. 74: 49539).
- OSAD'KO, I. S., "Low-temperature broadening and shift of phonon-free lines in case of strong coupling with crystal lattice", *Fiz. Tverd. Tela* 13, N 4, 1178-1186 (1971) (Russ).
- OVCHEVNIKOV, A. A. and ERIKHMAN, N. S., "Vibrational energy relaxation in molecular crystals", *Zh. Eksp. Teor. Fiz.* 61, N 6, 2391-2400 (1971) (Russ).
- PERSONOV, R. I., GODYAEV, E. D. and KOROTAEV, O. N., "On the line shape in luminescence quasi-linear spectra of organic molecules at 4.2°K", *Fiz. Tverd. Tela* 13, N 11, 111-116 (1971) (Russ).
- PERSONOV, R. I., OSAD'KO, I. S., GODYAEV, E. D. and AL'SHITS, E. I., "Study of phonon wings and phonon-free lines in spectra of n-paraffin impurity crystals", *Fiz. Tverd. Tela* 13, N 9, 2653-2663 (1971) (Russ) (P.A. 75: 1715).
- PHILPOTT, M. R., "Theory of the coupling of electronic and vibrational excitations in molecular crystals and helical polymers", *J. Chem. Phys.* 55, N 5, 2039-2054 (1971) (Eng) (P.A. 74: 69474).
- PHILPOTT, M. R., "Theory of molecular polaritons. Application to the reflection spectra of anthracene, 1,5-bis(dimethylamino)pentamethinium perchlorate, and some other cationic dye crystals", *J. Chem. Phys.* 54, N 5, 2120-2129 (1971) (Eng).
- RASHBA, E. I. and EDELSTEIN, V. M., "Theory of exciton-phonon complexes in strong magnetic fields", *Zh. Eksp. Teor. Fiz.* 61, N 6, 2580-2596 (1971) (Russ).
- REYN, K. F., "Optical detection of resonant phonon trapping", In: International conference on light scattering in solids. 19-23 Juillet 1971. Université de Paris VI, p. 160-161.
- RUVALDS, J., ECONOMOU, E. N. and NGAI, K. L., "Electron coupling to bound phonon pairs", *Phys. Rev. Letters* 27, N 7, 417-420 (1971) (Eng).
- SERIKOV, A. A., "Vibronic spectra of molecular crystals with participation of non-totally symmetrical vibrations", *Phys. Stat. Sol.(b)* 44, N 2, 733-746 (1971) (Eng) (P.A. 74: 40742).
- SHEKA, E. F., "Electron-vibronical spectra of molecules and crystals", *Usp. Fiz. Nauk* 104, N 4, 593-643 (1971) (Russ).
- SHEKA, E. F. and TERENETSKAYA, I. P., "Vibronic spectra of mixed naphthalene-octadeuteronaphthalene crystals and impurity exciton states", *Fiz. Tverd. Tela* 13, N 4, 1071-1078 (1971) (Russ) (P.A. 74: 45660).
- SLECHTA, J., "Interaction of Frenkel excitons with phonons in anthracene", *J. Phys.* C4, N 14, 2024-2028 (1971) (Eng) (P.A. 74: 83270).
- SUMI, H. and TOYOZAWA, Y., "Urbach-Martienssen rule and exciton trapped momentarily by lattice vibrations", *J. Phys. Soc. Japan* 31, N 2, 342-358 (1971) (Eng).
- SUNA, A., "Exact test of the adiabatic approximation for exciton-phonon interactions", *Phys. Stat. Sol.(b)* 45, N 2, 591-596 (1971) (Eng) (P.A. 74: 55797).
- WIKOWSKI, A. and ZGIERSKI, M. Z., "Theory of vibronic spectra in molecular crystals with four molecules in the unit cell: perylene", *Phys. Stat. Sol.(b)* 46, N 1, 429-441 (1971) (Eng) (P.A. 74: 62368).
- WIKOWSKI, A. and ZGIERSKI, M. Z., "Vibronic spectra of the perylene crystal", *Chem. Phys. Letters* 9, N 4, 336-338 (1971) (Eng) (P.A. 74: 45661).
- YAMADA, N., SHIONOYA, S. and KUSHIDA, T., "Phonon-assisted energy transfer-comparison between theory and experiment", *J. Phys. Soc. Japan* 30, N 5, 1507 (1971) (Eng).
- ZGIERSKI, M. Z., "Change of the vibrational frequency and the linear vibronic coupling in molecular crystals. II. One-phonon exciton transfer", *Acta Phys. Polon.* A40, N 1, 17-27 (1971) (Eng) (P.A. 74: 65467).
- ZGIERSKI, M. Z., "Change of the vibrational frequency and the linear vibronic coupling in molecular crystals. III. Optical absorption curve at exciton band in the zero-phonon approximation", *Acta Phys. Polon.* A40, N 1, 29-35 (1971) (Eng).
- ZGIERSKI, M. Z., "Temperature dependence of the singlet-triplet absorption band in molecular crystals", *Phys. Stat. Sol.(b)* 44, N 2, 565-569 (1971) (Eng) (P.A. 74: 37541).

7.5. Excitons in Mixed Crystals

- ANDO, T. and UEMURA, Y., "Screening effect in a disordered electron system. II. Application of the impurity band", *J. Phys. Soc. Japan* 31, N 2, 331-336 (1971) (Eng).
- BALL, M. A., "The electronic structure of disordered systems: I. The density of states of the Anderson tight binding model", *J. Phys. C4*, N 13, 1747-1756 (1971) (Eng) (P.A. 74: 76540).
- BASSANI, F., "Theory of impurity states", In: Theory of imperfect crystalline solids, Trieste, Italy, 12 Jan-19 Apr 1970 (Vienna, Austria: IAEA (Available in UK from HMSO) 265-302 (1971) (P.A. 74: 83256)).
- BERMUDIZ, J. M., "Vibrations of glasslike disordered systems. I. Diatomic chains in two dimensions", *J. Chem. Phys.* 54, N 10, 4150-4159 (1971) (Eng) (P.A. 74: 45009).
- BHATTACHARYA, A. K. and ROY, C. L., "Electron states of disordered systems", *Phys. Stat. Sol.(b)* 46, N 2, 509-517 (1971) (Eng) (P.A. 74: 69462).
- BLAGODAROV, A. N., LUTSENKO, E. L. and ROZENSHTEIN, L. D., "Localized states in organic dyes (Metal-free phthalocyanine)", *Phys. Stat. Sol.(a)* 5, N 2, 333-340 (1971) (Eng).
- BROUDE, V. L., LEIDERMAN, A. V. and TRATAS, T. G., "Energy spectrum of isotopically mixed naphthalene crystals", *Fiz. Tverd. Tela* 13, N 12, 3624-32 (1971) (Russ).
- CHANG, I. F. and MITRA, S. S., "Long wavelength optical phonons in mixed crystals", *Advan. Phys.* 20, N 85, 359-404 (1971) (Eng).
- DUBOVSKII, O. A., "Line shape of exciton absorption in orientation-disordered crystals", *Fiz. Tverd. Tela* 13, N 10, 3032-3034 (1971) (Russ) (P.A. 75: 7065).
- DY, K. S. and WU, S.-Y., "Electronic structure of disordered systems", *Phys. Rev. B3*, N 4, 1173-1179 (1971) (Eng) (P.A. 74: 28443).

- ECONOMOU, E. N. and COHEN, M. H., "Localization in one-dimensional disordered systems", *Phys. Rev. B4*, N 2, 396-404 (1971) (Eng).
- FOX, D., "Intensities of optical transitions in imperfect molecular crystals. I. Moments", *J. Chem. Phys.* 54, N 5, 2132-2135 (1971) (Eng) (P.A. 74: 37523).
- FREED, K. F., "A selfconsistent field theory of electron localization in disordered systems: the Anderson transition", *J. Phys. C4*, N 16, L331-L335 (1971) (Eng).
- GEORGE, G. A. and MORRIS, G. C., "Trapped exciton levels in single crystals of some halogenated benzenes", *J. Chem. Phys.* 54, N 2, 815-816 (1971) (Eng) (P.A. 74: 19406).
- HACKER, K., "Optical absorption in crystals containing impurities", *Phys. Stat. Sol.* 42, N 2, 687-692 (1970) (Eng) (P.A. 74: 19335).
- HOARE, M. R. and PAL, P., "Physical cluster mechanics: statics and energy surfaces for monoatomic systems", *Advan. Phys.* 20, N 84, 161-196 (1971) (Eng).
- HOCHSTRASSER, R. M. and TIEN-SUNG LIN, "Zeeman effect of oriented molecules in solids at low temperatures", In: Symposium on magneto-optical effects, London, England, 11-12 Dec 1969. London, England: Faraday Soc. 100-105 (1970) (Eng) (P.A. 74: 9812).
- HONG, H.-K. and KOPELMAN, R., "Contribution to the theory of Frenkel excitons in disordered molecular crystals", *J. Chem. Phys.* 55, N 7, 3491-3499 (1971) (Eng).
- HONG, H.-K. and KOPELMAN, R., "Random lattice calculations on Frenkel excitons in disordered molecular crystals— $^{13}\text{C}_{10}$ naphthalene", *J. Chem. Phys.* 55, N 11, 5380-5392 (1971) (Eng).
- KHACHATURIAN, A. G. and ESTRIN, YU. Z., "On local and quasilocal relaxation processes in crystals with impurities", *Zh. Eksp. Teor. Fiz.* 61, N 6, 2607-2614 (1971) (Russ).
- KOPSKÝ, V., "Phenomenological description of order-disorder by means of general correlations functions. I. General properties of correlations functions. Disordered state", *Czech. J. Phys.* B21, N 10, 1071-1089 (1971) (Eng).
- KOPSKÝ, V., "Phenomenological description of order-disorder by means of general correlation functions. II. Approximation of independent clusters", *Czech. J. Phys.* B21, N 10, 1090-1105 (1971) (Eng).
- KOZHUSHNER, M. A., "Theory of bound exciton states", *Zh. Eksp. Teor. Fiz.* 60, N 1, 220-229 (1971) (Russ) (P.A. 74: 28457).
- KVINTSEI, G. F. and UKRAINSKI, I. I., "Local states and nature of energy gap in polyene chains", *Ukr. Fiz. Zh.* 16, N 4, 617-620 (1971) (Russ).
- OSTAPENKO, N. I., SUGAKOV, I. and SHPAK, M. T., "Local excitons and exciton band structure in naphthalene", *Phys. Stat. Sol. (b)* 45, N 2, 729-733 (1971) (Eng) (P.A. 74: 58867).
- POTTER, N. and CALECKI, D., "Contribution to the theory of the electronic density of states in disordered structures", *Solid State Commun.* 9, N 17, 1489-1491 (1971) (Eng).
- SHARNOFF, M. and ITURBE, E. B., "Spin memory in the trapping of triplet excitons", *Phys. Rev. Letters* 27, N 9, 576-579 (1971) (Eng) (P.A. 74: 69479).
- SHEKA, E. F. and TERENETSKAYA, I. P., "Vibronic spectra of mixed naphthalene-octadeuteronaphthalene crystals and impurity exciton states", *Fiz. Tverd. Tela* 13, N 4, 1071-1078 (1971) (Russ) (P.A. 74: 45660).
- STERN, E. A., "New approximation in the electronic theory of disordered alloys", *Phys. Rev. B4*, N 2, 342-348 (1971) (Eng) (P.A. 74: 48871).
- SUGAKOV, V. I., "EPR of excited localized triplet states in molecular crystals", *Fiz. Tverd. Tela* 13, N 3, 858-862 (1971) (Russ).
- TAGGART, G. B. and TAHIR-KHELI, R. A., "Theory of disordered ternary alloys at intermediate temperatures", *Phys. Rev. B3*, N 4, 1059-1068 (1971) (Eng).
- TAYLOR, F. L., "Existence of a gap in the electronic density of states of a disordered system", *Phys. Rev. B4*, N 12, 4642-4643 (1971) (Eng) (P.A. 75: 4110).
- 7.6. Excitonic Mechanism of Energy Migration**
- BIRKS, J. B., "Energy transfer in organic systems. X. Pure and mixed crystals", *J. Phys. B3*, N 12, 1704-1714 (1970) (Eng).
- BURSHTEIN, K. Ya. and KOZHUSHNER, M. A., "The theory of inductive resonance energy transfer in condensed media at high temperature", *Fiz. Tverd. Tela* 13, N 2, 504-512 (1971) (Russ).
- CHU, N. Y. C., KAWAKA, K. and KEARNS, D. R., "Investigation of energy-transfer mechanisms in pyrene crystals", *J. Chem. Phys.* 55, N 7, 3059-3067 (1971) (Eng) (P.A. 74: 77012).
- DELOSH, R. G., "Electronic energy transfer between impurities in a solid via virtual-phonon processes", Wayne State Univ. Detroit, Mich. USA, thesis, 1970, 257 pp. Available from Univ. Microfilms, Ann Arbor, Mich., USA. Order No. 71-397 (Eng) (P.A. 74: 83228).
- FÜNFSCHILLING, J. and ZSCHORKE-GRÄNACHER, I., "Exciton migration in molecular crystals", *Helv. Phys. Acta* 44, N 5, 578 (1971) (Ger) (P.A. 74: 80097).
- GOLUBOV, S. I. and KONOBEEV, YU. V., "Averaging procedure in theory of resonance transfer of electron excitation energy", *Fiz. Tverd. Tela* 13, N 11, 3185-3189 (1971) (Eng) (P.A. 75: 10433).
- GROYER, M. and SILBEE, R., "Exciton migration in molecular crystals", *J. Chem. Phys.* 54, N 11, 4843-4851 (1971) (Eng) (P.A. 74: 45105).
- HEBER, J., "Exciton-diffusion-limited energy transfer in solids. I. Theory of the dynamics", *Phys. Stat. Sol. (b)* 48, N 1, 319-326 (1971) (Eng) (P.A. 75: 4417).
- HOCHSTRASSER, R. M. and PRASAD, P. N., "Some aspects of spin-lattice relaxation amongst triplet states of molecules and molecular excitons", *Chem. Phys. Letters* 9, N 2, 113-114 (1971) (Eng).
- NAGIBAROV, V. R. and NAGIBAROVA, I. A., "Supermigration", *Ukr. Fiz. Zh.* 16, N 5, 847-848 (1971) (Russ).
- NAGIBAROV, V. R. and NAGIBAROVA, I. A., "Supermigration", In: Proceedings of the first All-Union seminar on energy transfer in condensed media. Lori, Armenia 6-12 Oct 1969, Erevan 33-39 (1970) (Russ).
- NAGIBAROV, V. R. and NAGIBAROVA, I. A., "Supermigration of excitation energy", *Opt. and Spektrosk.* 31, N 1, 70-76 (1971) (Russ).
- NAGIBAROVA, I. A. and SHEGEDA, A. M., "Nonresonance energy migration in solids", *Opt. and Spektrosk.* 30, N 1, 174-177 (1971) (Russ).
- NAGIBAROVA, I. A. and SHEGEDA, A. M., "Temperature dependence of non-resonance energy migration in solids", *Phys. Stat. Sol. (b)* 48, N 2, 505-508 (1971) (Eng).
- PEARLSTEIN, E. M., HEMENGER, R. P. and LAKATOS-LINDENBERG, K., "Anomalous exciton-quenching kinetics in doped polyacenes", *Phys. Rev. Letters* 27, N 22, 1509-1511 (1971) (Eng) (P.A. 75: 6738).

- POWELL, R. C., "Energy transfer in anthracene- and tetracene-doped naphthalene crystals", *Phys. Rev. B4*, N 2, 628-635 (1971) (Eng) (P.A. 74: 53290).
- POWELL, R. C., "Energy transfer in poly(vinyl toluene)", *J. Chem. Phys.* 55, N 4, 1871-1877 (1971) (Eng).
- SOULES, T. F. and DUKE, C. B., "Resonant energy transfer between localized electronic states in a crystal", *Phys. Rev. B3*, N 2, 262-274 (1971) (Eng).
- TOMURA, M. and TAKAHASHI, Y., "Migration of excimer energy in pyrene crystal", *J. Phys. Soc. Japan* 31, N 3, 797-801 (1971) (Eng).
- TRIFONOV, E. D., "Theory of excitation transfer in crystals with impurity centres", *Izvest. Akad. Nauk SSSR, Ser. Fiz.* 35, N 7, 1330-1335 (1971) (Russ) (P.A. 74: 69953).
- VAUBEL, G., "Intersystem crossing between guest and host molecules in anthracene mixed crystals", *Chem. Phys. Letters* 9, N 1, 51-53 (1971) (Eng).
- WEBER, M. J., "Luminescence decay by energy migration and transfer: observation of diffusion-limited relaxation", *Phys. Rev. B4*, N 9, 2932-2939 (1971) (Eng).
- WOLF, H. C. and BENZ, K. W., "Energy trapping processes in aromatic crystals", *Pure and Appl. Chem.* 27, 439-456 (1971) (Eng).
- ZIMMERMANN, H., STEHLIK, D. and HAUSSER, K. H., "Excitation of triplet excitons in aromatic single crystals by guest-host energy transfer", *Chem. Phys. Letters* 11, N 4, 496-500 (1971) (Eng) (P.A. 75: 4135).

8. Photoconductivity of Molecular Crystals. Photoelectronic Emission

- AGORANOVICH, V. M. and MEKHTEV, M. A., "Spectra of organic molecules incorporated into metal matrix and exciton mechanism of high-temperature superconductivity", *Fiz. Tverd. Tela* 13, N 9, 2732-2742 (1971) (Russ) (P.A. 75: 1683).
- ARMAGAN, O. K. H. H., "Canalizing effect of electrons and positrons in Si and anthracene crystals", *Z. Phys.* 240, N 4, 314-322 (1970) (Ger).
- AUBAILLY, M., BAZIN, M. and SANTUS, R., "The role of photoejected electrons in the delayed fluorescence of indole derivatives in frozen aqueous solutions at 77°K", *Chem. Phys. Letters* 12, N 1, 70-74 (1971) (Eng) (P.A. 75: 10432).
- BABENKO, S. D., BENDERSKII, V. A. and LAVRUCHKO, A. G., "Investigation of fluorescence and photoconductance of aromatic hydrocarbon crystals and solutions", *Zh. Prikl. Spektrosk.* 14, N 1, 111-114 (1971) (Russ) (P.A. 74: 37631).
- BAESSLER, H., KILLESREITER, H. and VAUBEL, G., "Exciton-induced photocurrents in molecular crystals", *Disc. Faraday Soc.* N 51, 48-53 (1971) (Eng).
- BAUSER, H. and PERNISZ, U., "Field effect in anthracene crystal", *Chem. Phys. Letters* 11, N 2, 213-215 (1971) (Eng).
- BENDERSKII, V. A. and LAVRUCHKO, A. G., "Light reabsorption and photoconductivity of anthracene crystals", *Fiz. Tverd. Tela* 13, N 5, 1282-1287 (1971) (Russ).
- BLYTHER, A. R., BOON, M. R. and WRIGHT, P. G., "Measurement of Seebeck and Hall effects in compacted of TCNQ salts", *Disc. Faraday Soc.* N 51, 110-115 (1971) (Eng).
- BONNIFACE, D. W., BRAITHWAITE, M. J., ELEY, D. D., EVANS, R. G., PETHIG, R. and WILLIS, M. R., "Factors affecting conduction in polymeric complex TCNQ salts", *Disc. Faraday Soc.* N 51, 131-138 (1971) (Eng).
- BULAYEVSKY, L. N. and KUKHARENKO, YU. A., "On efficiency of the exciton mechanism of superconductivity in lamellar compounds with molecules", *Zh. Eksp. Teor. Fiz.* 60, N 4, 1518-1524 (1971) (Russ).
- CAMPOS, M., MASCARENHAS, S. and FERREIRA, G. L., "Schottky barrier formation in naphthalene electrets", *Phys. Rev. Letters* 27, N 21, 1432-1433 (1971) (Eng).
- CARLSON, T. A. and ANDERSON, C. P., "Angular distribution of the photoelectron spectrum for benzene", *Chem. Phys. Letters* 10, N 5, 561-564 (1971) (Eng).
- DAY, P. and LANGTON, J., "Low-temperature photoconductivity of matrix-isolated molecules", *Disc. Faraday Soc.* N 51, 85-93 (1971) (Eng).
- DIMOND, N. A. and MUKHERJEE, T. K., "Chromophoric conditioning of photoelectric response in polar molecules", *Disc. Faraday Soc.* N 51, 102-109 (1971) (Eng).
- ELEY, D. D. and PETHIG, R., "Microwave dielectric and Hall effect measurements on biological materials", *Disc. Faraday Soc.* N 51, 164-175 (1971) (Eng).
- EWALD, M. and DUROCHER, G., "Photoionization and recombination delayed fluorescence in anthracene single crystals", *Chem. Phys. Letters* 12, N 2, 385-388 (1971) (Eng).
- FARKAS, Gy., HORVÁTH, Z. Gy., KERTÉSZ, I. and KISS, G., "Nonlinear photoelectric electron emission induced by picosecond mode-locked laser pulses", *Lett. Nuovo Cimento* 1, N 8, 314-318 (1971) (Eng).
- FRANKOVICH, Ye. L., "Paramagnetic excitons and their role in photoconductivity and fluorescence of anthracene and tetracene", *Disc. Faraday Soc.* N 51, 37-47 (1971) (Eng).
- GAMBLE, F. R., DISALVO, F. J., KLEMM, R. A. and GEBALLE, T. H., "Superconductivity of layered structure organometallic crystals", *Science* 168, N 3931, 568-570 (1970) (Eng).
- HAARER, D. and CASTRO, G., "Exciton induced photoemission in anthracene", *Chem. Phys. Letters* 12, N 2, 277-280 (1971) (Eng).
- HALE, J. M. and MEHL, W., "Quenching of excited states at the interface, molecular crystal/electrolyte", *Disc. Faraday Soc.* N 51, 54-60 (1971) (Eng).
- HILL, A. R., JR. and MALLEY, M. M., "Electrochromism of perylene and rhodamine 6 G", *J. Mol. Spectrosc.* 40, N 2, 428-430 (1971) (Eng).
- HUG, G. and BERRY, R. S., "Interaction of electrons and holes in a molecular crystal", *J. Chem. Phys.* 55, N 5, 2516-2521 (1971) (Eng) (P.A. 74: 65571).
- HUGHES, R. C., "Geminate recombination of X-ray excited electron-hole pairs in anthracene", *J. Chem. Phys.* 55, N 12, 5442-5447 (1971) (Eng).
- INOUCHI, H., "Catalytic activity of organic semiconductors and enzymes", *Disc. Faraday Soc.* N 51, 183-189 (1971) (Eng).
- KEYORIAN, J., LABES, M. M., LARSON, D. C. and WU, D. C., "Bistable switching in organic thin films", *Disc. Faraday Soc.* N 51, 139-143 (1971) (Eng).

- KILLESREITER, H. and BAESSLER, H., "Exciton reaction at an anthracene/metal interface: charge transfer", *Chem. Phys. Letters* **11**, N 4, 411-414 (1971) (Eng).
- KILLESREITER, H. and BRAUN, R., "Transient photocurrents induced by time-dependent diffusion of excitons to the surface of anthracene and *p*-chloranil single crystals", *Phys. Stat. Sol.(b)* **48**, N 1, 201-213 (1971) (Eng).
- KOTANI, M. and AKAMATU, H., "Contact potential difference and work function of organic crystals", *Disc. Faraday Soc.* N 51, 94-101 (1971) (Eng).
- KRISCH, O., "Charge carrier mobility in pure and tetracene doped anthracene crystals", *Z. Phys.* **248**, N 2, 185-194 (1971) (Ger).
- KRYSZEWSKI, M., WOJCIECHOWSKI, P. and SAPIEHA, S., "Electrical and magnetic properties of poly-(phenyleneaminochloranils)", *Disc. Faraday Soc.* N 51, 144-155 (1971) (Eng).
- KUREMATSU, K., KANEKO, N. and MATSUMOTO, S., "Electrical conductivity in crystalline hexamethylbenzene", *Bull. Chem. Soc. Japan* **44**, N 10, 2845-2847 (1971) (Eng).
- LAVRUSHKO, A. G. and BENDERSKII, V. A., "Efficiency of different processes of charge carrier generation in anthracene crystals", *Fiz. Tverd. Tela* **13**, N 5, 1467-1469 (1971) (Russ).
- LAVRUSHKO, A. G. and BENDERSKII, V. A., "Triplet-triplet annihilation and photoconductivity of anthracene crystals", *Fiz. Tverd. Tela* **13**, N 1, 284-286 (1971) (Russ) (*P.A.* **74**: 37630).
- LOBANOVA, O. E. and LUSHCHENKO, E. L., "Thermostimulated conductivity in triphenyl methane dyes", *Fiz. Tekh. Poluprov.* **5**, N 2, 341-343 (1971) (Russ).
- LYONS, L. E. and NEWMAN, O. M. G., "Photovoltages in tetracene films", *Aust. J. Chem.* **24**, N 1, 13-23 (1971) (Eng).
- MCKELLAR, J. R., WEIGHMAN, J. A. and WILLIAMS, R. J. P., "Electrical conductivity of some organic materials containing metals", *Disc. Faraday Soc.* N 51, 176-182 (1971) (Eng).
- MOGILEVSKII, B. M. and SURIN, V. G., "Naphthalene thermal conductivity", *Fiz. Tverd. Tela* **13**, N 8, 2471-2473 (1971) (Russ).
- MOGILEVSKII, B. M. and SURIN, V. G., "Thermal conductivity of organic compounds with phase transitions in solid state", *Fiz. Tverd. Tela* **13**, N 5, 1345-1348 (1971) (Russ).
- MORRIS, H. and YATES, J., "Calculation of the energy band structure and carrier mobilities in crystalline coronene and ovalene", *Disc. Faraday Soc.* N 51, 24-36 (1971) (Eng).
- PETER, L. and VAUBEL, G., "Charge carrier-exciton interaction in crystalline tetracene", *Phys. Stat. Sol.(b)* **48**, N 2, 587-590 (1971) (Eng).
- PETROVA, M. L. and ROZENSTEIN, L. D., "The field effect and slow states in layers of organic semiconductors", *Fiz. Tverd. Tela* **13**, N 8, 2325-2330 (1971) (Russ).
- POPE, M. and KALLMANN, H., "Photoconductivity and semiconductivity in organic crystals", *Disc. Faraday Soc.* N 51, 7-16 (1971) (Eng).
- REUCROFT, P. J. and SIMPSON, W. H., "Electrical characteristics of chlorophyll *a* films", *Disc. Faraday Soc.* N 51, 202-211 (1971) (Eng).
- ROSENBERG, B., "Semiconductivity and photoconductivity properties of bimolecular lipid membranes", *Disc. Faraday Soc.* N 51, 190-201 (1971) (Eng).
- SCHWOB, H. P. and ZSCHOKKE-GRANACHER, I., "Double injection and electroluminescence in doped anthracene", *Mol. Cryst. and Liq. Cryst.* **13**, N 2, 115-136 (1971) (Ger) (*P.A.* **74**: 53300).
- SPIELBERG, D. H., KORN, A. I. and DAMASK, A. C., "Experimental and theoretical Hall mobilities of holes and electrons in naphthalene", *Phys. Rev.* **B3**, N 6, 2012-2015 (1971) (Eng).
- THOMAS, J. M., EVANS, J. R. N. and LEWIS, T. J., "Carrier injection and related phenomena in molecular crystals", *Disc. Faraday Soc.* N 51, 73-84 (1971) (Eng).
- TURNER, D. W., "Molecular photoelectron spectroscopy", *Phil. Trans. Roy. Soc. London* **A268**, N 1184, 7-31 (1970) (Eng).
- VAUBEL, G., BAESSLER, H. and MÖHRIS, D., "Reaction of singlet excitons at an anthracene/metal interface: energy transfer", *Chem. Phys. Letters* **10**, N 3, 334-336 (1971) (Eng).
- VENGHAUS, H., "The dielectric tensor components of anthracene derived from energy loss experiments", *Z. Phys.* **239**, N 4, 289-299 (1970) (Eng).
- VOLOSHIN, V. A., GALKIN, A. A., IVANCHENKO, Iu. M., IGNATIEV, O. M., TARENKOV, V. Iu. and KHREBTOV, A. O., "The influence of organic admixtures on the tunnel conductivity", *Dokl. Akad. Nauk SSSR* **193**, N 4, 788-790 (1970) (Russ).
- WILLIAMS, W. G., "Hole mobility in rubrene", *Disc. Faraday Soc.* N 51, 61-66 (1971) (Eng).

9. Effects of High Exciton Concentration in Non-metallic Crystals

- ADAMOWSKI, J., BEDNAREK, S. and SUFECZYNSKI, M., "Binding energy of the biexcitons", *Solid State Commun.* **9**, N 23, 2037-2038 (1971) (Eng) (*P.A.* **75**: 9940).
- ASNIN, V. M., ROGACHEV, A. A. and SABLINA, N. I., "Biexcitons and exciton condensate in germanium", *Fiz. Tekh. Poluprov.* **5**, N 4, 802-805 (1971) (Russ) (*P.A.* **74**: 53271).
- ASNIN, V. M., ROGACHEV, A. A. and SABLINA, N. I., "Kinetics of radiative recombination of biexcitons in germanium", *Fiz. Tekh. Poluprov.* **5**, N 9, 1846-1849 (1971) (Russ) (*P.A.* **75**: 4479).
- AURICH, F. and MARQUARD, J., "High exciton densities by thermal stimulation of traps in crystalline benzene", *Chem. Phys. Letters* **11**, N 2, 167-170 (1971) (Eng) (*P.A.* **74**: 80473).
- BABENKO, S. D., BENDERSKII, V. A., GOL'DANSKII, V. I., LAVRUSHKO, A. G. and TYCHINSKII, V. P., "Annihilation of singlet excited states in anthracene solutions", *Chem. Phys. Letters* **8**, N 6, 598-600 (1971) (Eng).
- BABENKO, S. D., BENDERSKII, V. A., GOL'DANSKII, V. I., LAVRUSHKO, A. G. and TYCHINSKII, V. P., "Singlet exciton annihilation in anthracene crystals", *Phys. Stat. Sol.(b)* **45**, N 1, 91-97 (1971) (Eng).
- BAGAEV, V. S., GALKINA, T. I. and GOGOLIN, O. V., "Excitons in Ge at high concentrations and low temperatures", In: Proceedings of the 10th international conference on the physics of semiconductors, Cambridge, Mass., USA, 17-21 Aug 1970. Washington, D.C., USA: US Atomic Energy Commission 500-504 (1970) (Eng) (*P.A.* **74**: 66125).
- BENOÎT à la GUILLAUME, C., VOOS, M. and SALVAN, F., "Motion of electron-hole draps in pure Ge", *Phys. Rev. Letters* **27**, N 18, 1214-1217 (1971) (Eng).
- BOBRYsheva, I. A., MIGLEY, M. F., MOSKALENKO, S. A. and SHMIGLYUK, M. F., "On two excitons interaction in crystal", In: Complex semiconductors and their physical properties, Kishinev, 25-34 (1971) (Russ).

- GROSS, E. F., STAROSTIN, N. V. and SHEKHMAMETJEV, R. I., "Study of bielectron and bihall in Bi iodide crystal", *Fiz. Tverd. Tela* **13**, N 11, 3393-3397 (1971) (Russ).
- HANAMURA, E., "On the high density Wannier excitons", In: Proceedings of the 10th international conference on the physics of semiconductors, Cambridge, Mass., USA, 17-21 Aug 1970. Washington, D.C., USA: US Atomic Energy Commission 487-493 (1970) (Eng) (P.A. 74: 62017).
- IWAI, S. and NAMBA, S., "Emission spectra in CdS under high excitation by electron beam", *Appl. Phys. Letters* **19**, N 2, 41-43 (1971) (Eng).
- KHADZHY, P. I., "Exciton-electron and exciton-exciton collisions", In: *Complex semiconductors and their physical properties*. Kishinev, 108-122 (1971) (Russ).
- KHADZHY, P. I. and MOSKALENKO, S. A., "Hydrodynamics of excitons in semiconductors", In: *Investigation of complex semiconductors*. Kishinev, 213-225 (1970) (Russ).
- KOHN, W. and SHERRINGTON, D., "Two kinds of bosons and Bose condensates", *Rev. Mod. Phys.* **42**, N 1, 1-11 (1970) (Eng).
- KUKIMOTO, H., SHIONOYA, S. and KAMEJIMA, T., "Exciton-exciton interaction in Cd(S, Se) crystals as studied by using argon ion laser", *J. Phys. Soc. Japan* **30**, N 6, 1662-1668 (1971) (Eng) (P.A. 74: 49195).
- LEE, D. K., "Theory of many-boson systems in the weak coupling limit", *Phys. Letters* **37A**, N 1, 49-50 (1971) (Eng).
- L'YOV, O. I. and PAVINSKII, P. P., "Biexciton in Cu_2O crystal", *Zh. Eksp. Teor. Fiz. Pis'ma* **14**, N 4 253-256 (1971) (Russ) (P.A. 74: 83745).
- MA, S.-K., GOULD, H. and WONG, V. K., "Phonon dispersion in a low-temperature weakly interacting Bose gas", *Phys. Rev. A* **3**, N 4, 1453-1462 (1971) (Eng).
- NOVIKOV, B. V. and PIMONENKO, M. M., "Exciton-exciton interaction in luminescence spectrum of cubic SiC", *Fiz. Tverd. Tela* **13**, N 9, 2777-2780 (1971) (Russ) (P.A. 75: 1712).
- PADMORE, T. C. and FETTER, A. L., "Impurities in an imperfect Bose gas. I. The condensate", *Ann. Phys.* **62**, N 2, 293-319 (1971) (Eng).
- PARAKHAE, V. V. and KRISHNAMURTHY, B. S., "On the possibility of Bose condensation of optical modes in polar semiconductors", *J. Phys. C* **3**, N 10, 2098-2102 (1970) (Eng).
- PORROVSKY, Ya. Ya., KAMINSKY, A. and SVISTUNOVA, K., "Experimental evidences of the existence of condensed phase of non-equilibrium charge carriers in Ge and Si", In: Proceedings of the 10th international conference on the physics of semiconductors, Cambridge, Mass., USA, 17-21 Aug 1970. Washington, D.C., USA: US Atomic Energy Commission 504-509 (1970) (Eng) (P.A. 74: 66106).
- PORROVSKY, Ya. Ya. and SVISTUNOVA, K. I., "Light scattering by drops of condensed phase of non-equilibrium carriers in Ge", *Zh. Eksp. Teor. Fiz. Pis'ma* **13**, N 6, 297-301 (1971) (Russ).
- SHAKLEE, K. L., LEHENY, R. F. and NAHORY, R. E., "Stimulated emission from the excitonic molecules in CuCl ", *Phys. Rev. Letters* **26**, N 15, 888-891 (1971) (Eng) (P.A. 74: 33520).
- SHERINGTON, D., "A note on Bose condensation", *Phys. Letters* **37A**, N 3, 223-224 (1971) (Eng).
- SOUHA, H., SUZUKI, K. and UETA, M., "Stimulated emission of excitonic molecule in CuCl single crystals", *J. Phys. Soc. Japan* **30**, N 2, 589-590 (1971) (Eng).
- SOUHA, H., KOIKE, H., SUZUKI, K. and UETA, M., "Stimulated emission of excitonic molecule in CuBr ", *J. Phys. Soc. Japan* **31**, N 4, 1285 (1971) (Eng) (P.A. 75: 4473).
- VOL, E. D., GOLOYADOV, V. A., KUKUSHKIN, L. S., NABOYKIN, Yu. V. and SILAEVA, N. B., "Exciton-exciton annihilation in pyrene crystals", *Phys. Stat. Sol.(b)* **47**, N 2, 685-692 (1971) (Eng) (P.A. 74: 76575).

10. Excitons and Magnons in Antiferromagnetic Crystals

- AKHIEZER, I. A. and GINZBURG, A. E., "Coupled electromagnetic-spin waves near the transition point between ferromagnetic and antiferromagnetic phases", *Fiz. Tverd. Tela* **13**, N 11, 3220-3224 (1971) (Russ).
- ALLEN, S. J., Jr. and GUGGENHEIM, H. J., "Magnetic excitations in antiferromagnetic CoF_2 . I. Spin-optical-phonon interaction", *Phys. Rev. B* **4**, N 3, 937-950 (1971) (Eng) (P.A. 74: 53109).
- ALLEN, S. J., Jr. and GUGGENHEIM, H. J., "Magnetic excitations in antiferromagnetic CoF_2 . II. Uniform magnetic excitations near $T = 0^\circ\text{K}$ ", *Phys. Rev. B* **4**, N 3, 950-968 (1971) (Eng) (P.A. 74: 53110).
- ALLEN, S. J., Jr. and GUGGENHEIM, H. J., "Spin waves and excitons in antiferromagnetic CoF_2 ", *J. Appl. Phys.* **42**, N 4, 1657-1658 (1971) (Eng) (P.A. 74: 49549).
- AOYAGI, K., TSUSHIMA, K., UESUGI, M. and SUGANO, S., "Optical studies of electron relaxation in magnetic materials", In: 7e conference internationale de magnetisme 1970. Grenoble, France, 14-19 Sep 1970. Vol. 2. *J. Phys.*, suppl. **32**, N 2-3, C1-801 (1971) (Eng).
- BARIAKHTAR, V. G., BOROVIK, A. E., POPOV, V. A. and STEFANOVSKII, E. P., "Domain structure during the first order phase transition from the antiferro- into ferromagnetic state", *Fiz. Tverd. Tela* **13**, N 11, 3232-3239 (1971) (Russ).
- BARRY, J. H. and HARRINGTON, D. A., "Theory of relaxation phenomena in Ising antiferromagnets", *Phys. Rev. B* **4**, N 9, 3068-3077 (1971) (Eng).
- BATES, J. B., "Raman spectrum of crystalline MoF_5 ", *Spectrochim. Acta* **27A**, N 8, 1255-1258 (1971) (Eng) (P.A. 74: 59372).
- BELIAEVA, A. I., ERYOMENKO, V. V. and SILAYEV, V. I., "Effect of magnetic impurities on formation of the KMnF_3 exciton-magnon absorption spectrum structure", *Ukr. Fiz. Zh.* **16**, N 11, 1898-1902 (1971) (Russ).
- BERNSTEIN, T., MISETICH, A. and LAX, B., "High magnetic field investigation of localized magnons in Fe^{2+} -doped MnF_2 ", *J. Appl. Phys.* **42**, N 4, 1653-1654 (1971) (Eng) (P.A. 74: 49568).
- BERNSTEIN, T., MISETICH, A. and LAX, B., "Observation of the k -dependent contribution of the dipole-dipole interaction to the spin-wave energies in MnF_2 ", *Phys. Letters* **31A**, N 2, 71-72 (1970) (Eng).
- BLEWITT, R. and WEBER, R., "High-magnetic-field spectroscopy of MnF_2 and $\text{MnF}_2 \cdot \text{Fe}^{2+}$ in the far infrared", *J. Appl. Phys.* **41**, N 3, 884-885 (1970) (Eng).
- BOITEUX, M., DOUSSINEAU, E., FERRY, B., JOFFRIN, J. and LEVELUT, A., "Acoustical Faraday effect in antiferromagnetic Cr_2O_3 ", *Phys. Rev. B* **4**, N 9, 3077-3088 (1971) (Eng).
- BROMLEY, R. A., "The lattice vibrations of the MoS_2 structure", *Phil. Mag.* **23**, N 186, 1417-1427 (1971) (Eng) (P.A. 74: 48796).

- BROWN, F. C., GÄHWILLER, C. and KUNZ, A. B., "Extreme ultraviolet absorption and band density of NiO", *Solid State Commun.* 9, N 8, 487-491 (1971) (Eng).
- BUXTON, R. A. H. and DULEY, W. W., "Vacuum ultraviolet reflection spectrum of solid oxygen", *Opt. Commun.* 3, N 3, 137-140 (1971) (Eng).
- BUYERS, W. J. L., HOLDEN, T. M., SVENSSON, E. C., COWLEY, R. A. and STEVENSON, R. W. H., "Character of excitations in substitutionally disordered antiferromagnets", *Phys. Rev. Letters* 27, N 21, 1442-1445 (1971) (Eng).
- BUYERS, W. J. L., HOLDEN, T. M., SVENSSON, E. C., COWLEY, R. A. and HUTCHINGS, M. T., "Excitations in KCoF₃. II. Theoretical", *J. Phys.* C4, N 14, 2139-2159 (1971) (Eng).
- CAILLE, A. and WALLACE, P. R., "Interaction of magnon and Alfvén waves in itinerant antiferromagnetic chromium: II", *Solid State Commun.* 9, N 16, 1437-1441 (1971) (Eng).
- CAIRD, R. S., GARN, W. B., FOWLER, C. M. and THOMSON, D. B., "Optical absorption spectrum of MnF₂ at high fields", *J. Appl. Phys.* 42, N 4, 1651-1652 (1971) (Eng) (P.A. 74: 53224).
- CHAO, C.-C., "Charge-transfer luminescence of Cr³⁺ in magnesium oxide", *J. Phys. Chem. Solids* 32, N 11, 2517-2528 (1971) (Eng).
- CHEN-CHOU NI and WEINSTOCK, H., "Magnon conductivity in antiferromagnetic cobalt chloride thiourea, CoCl₂(NH₄)₂CS₂", *Phys. Letters* 34A, N 1, 3-4 (1971) (Eng).
- CHETNIK, M. V., SHALYGIN, A. N., SCHERBACOV, YU. I., AKHUTKINA, A. I., MEDVEDEV, S. A. and CHERVONENKIS, A. Ya., "Magneto-optical properties of orthoferrites and garnets in infrared", In: 7e conference internationale de magnetisme 1970. Grenoble, France, 14-19 Sep 1970. Vol. 2. *J. Phys. suppl.* 32, N 2-3, C1-796 (1971) (Eng).
- CHINN, S. R., DAVIES, R. W. and ZEIGER, H. J., "Spin-wave theory of two-magnon Raman scattering in a two-dimensional antiferromagnet", *Phys. Rev.* B4, N 11, 4017-4023 (1971) (Eng).
- CHINN, S. R., ZEIGER, H. J. and O'CONNOR, J. R., "Two-magnon Raman scattering in KNiF₃", *J. Appl. Phys.* 41, N 3, 894-895 (1970) (Eng).
- CIPRIANI, J., RACINE, S. and DUPEYRAT, R., "Raman scattering by two-magnon excitations in CoF₂", *Phys. Letters* 34A, N 3, 187-188 (1971) (Eng) (P.A. 74: 37586).
- DAVIES, R. W., CHINN, S. R. and ZEIGER, H. J., "Spin-wave approach to two-magnon Raman scattering in a simple antiferromagnet", *Phys. Rev.* B4, N 3, 992-1004 (1971) (Eng).
- DECKER, D. L. and WILD, R. L., "Optical properties of α -MnSe", *Phys. Rev.* B4, N 10, 3425-3437 (1971) (Eng).
- DIETZ, R. E., PARISOT, G. I. and MEIXNER, A. E., "Infrared absorption and Raman scattering by two-magnon processes in NiO", *Phys. Rev.* B4, N 7, 2302-2310 (1971) (Eng).
- DIETZ, R. E., BRINKMAN, W. F., MEIXNER, A. E. and GUGGENHEIM, H. J., "Raman scattering by four magnons in NiO and KNiF₃", *Phys. Rev. Letters* 27, N 12, 814-817 (1971) (Eng).
- DUDKO, K. L., YEREMENKO, V. V. and FRIDMAN, V. M., "Magnetic stratification on overturning of antiferromagnetic manganese fluoride sublattices", *Zh. Eksp. Teor. Fiz.* 61, N 2, 678-688 (1971) (Russ).
- DUDKO, K. L., YEREMENKO, V. V. and FRIDMAN, V. M., "Magnetization discontinuities and the domain structure of magnesium fluoride during sublattice overturning", *Zh. Eksp. Teor. Fiz.* 61, N 4, 1553-1563 (1971) (Russ).
- DUNCAN, C. K. and KEARNS, D. R., "The annihilation of Δ_g oxygen by excited triplet state sensitizers", *Chem. Phys. Letters* 12, N 2, 306-309 (1971) (Eng).
- FEINLEIB, J. and PIDGEON, C. R., "Optical observation of magnetic-field-induced spin alignment in antiferromagnetic EuTe", *Phys. Rev. Letters* 23, N 24, 1391-1394 (1969) (Eng).
- FLEURY, P. A., "Effects of phase transitions on the spectrum of light inelastically scattered by antiferromagnets", *Int. J. Magn.* 1, N 1, 75-83 (1970) (P.A. 74: 9806).
- FLEURY, P. A., LOUDON, R. and WALKER, L. R., "Magnetic field dependence of magnon frequencies in the canted-spin antiferromagnet NiF₂", *J. Appl. Phys.* 42, N 4, 1649-1650 (1971) (Eng) (P.A. 74: 49593).
- FLEURY, P. A. and GUGGENHEIM, H. J., "Magnon-pair modes in two dimensions", *Phys. Rev. Letters* 24, N 24, 1346-1349 (1970) (Eng).
- FLEURY, P. A., "Paramagnetic spin waves correlation functions in NiF₂", *Phys. Rev.* 180, N 2, 591-593 (1969) (Eng).
- FLEURY, P. A., "Temperature dependence of magnon-pair modes in antiferromagnets and paramagnets", *J. Appl. Phys.* 41, N 3, 886-888 (1970) (Eng).
- FREEMAN, S., "Excited state exchange in MnF₂", *J. Appl. Phys.* 42, N 4, 1645-1646 (1971) (Eng) (P.A. 74: 49565).
- FRIEBELE, E. J., WILSON, L. K., DOZIER, A. W. and KINSEY, D. L., "Antiferromagnetism in an oxide semiconducting glass", *Phys. Stat. Sol.(b)* 45, N 1, 323-331 (1971) (Eng).
- GASSER, W. and ROTH, S., "Damping of optical magnons due to magnon-phonon interaction", *Phys. Stat. Sol.(b)* 44, N 1, K9-K11 (1971) (Eng) (P.A. 74: 37348).
- GELDART, D. J. W., "Resistive anomalies of antiferromagnets above the Néel point", *J. Phys.* C4, N 9, L153-L156 (1971) (Eng).
- GOCHY, I. G., "Magnon bound states in a linear anisotropic chain", *Zh. Eksp. Teor. Fiz.* 61, N 4, 1674-1678 (1971) (Russ).
- GOOEN, K., DI BARTOLO, B., ALAM, M. and POWELL, R. C., "Thermal dependence of the Mn²⁺ and Nd³⁺ fluorescence and the Mn²⁺ - Nd³⁺ energy transfer in RbMnF₃", *Phys. Rev.* 177, N 2, 615-625 (1969) (Eng).
- GRIESEN, R., LANDOLT, M. and OTT, H. R., "A new antiferromagnetic phase in EuSe below 1.8 K", *Solid State Commun.* 9, N 24, 2219-2223 (1971) (Eng).
- GUSTAFSON, J. C. and WALKER, C. T., "Magnon transport effects in the thermal conductivity of RbMnF₃", *Phys. Letters* 35A, N 5, 363-364 (1971) (Eng).
- HEYNS, A. M. and SCHUTTE, C. J. H., "Low-temperature infrared studies. VII. The infrared spectrum of and possible antiferromagnetic transition in ammonium trichlorocuprate NH₄CuCl₃", *J. Mol. Structure* 8, N 3, 339-349 (1971) (Eng).
- HOLDEN, T. M., BUYERS, W. J. L., SVENSSON, E. C., COWLEY, R. A., HUTCHINGS, M. T., HUKIN, D. and STEVENSON, R. W. H., "Excitations in KCoF₃- I. Experimental", *J. Phys.* C4, N 14, 2127-2138 (1971) (Eng).
- HOLDEN, T. M., SVENSSON, E. C., BUYERS, W. J. L., COWLEY, R. A. and STEVENSON, R. W. H., "Two-magnon scattering of neutrons by MnF₂", *J. Appl. Phys.* 41, N 3, 896-897 (1970) (Eng).
- HOLLOWAY, W. W., JR. and KESTIGIAN, M., "The temperature dependence of the broadband fluorescence of KMnCl₃, RbMnCl₃ and CsMnCl₃", *Phys. Letters* 29A, N 11, 709-710 (1969) (Eng).

- HOLZRICHTER, J. F., MACFARLANE, R. M. and SCHAWLOW, A. L., "Magnetization induced by optical pumping in antiferromagnetic MnF_2 ", *Phys. Rev. Letters* **26**, N 11, 652-655 (1971) (Eng).
- HUTCHINGS, M. T., THORPE, M. F., BIRGENEAU, R. J., FLEURY, P. A. and GUGGENHEIM, H. J., "Neutron and optical investigation of magnons and magnon-magnon interaction effects in NiF_2 ", *Phys. Rev.* **B2**, N 5, 1362-1372 (1970) (Eng).
- IDOGAKI, T., IWASHITA, T. and URYU, N., "Note on the antiferromagnetic interactions in trinuclear complexes", *J. Chem. Phys.* **54**, N 2, 816-817 (1971) (Eng).
- INOUE, M. and MORIYA, T., "Raman scattering by magnons in rare earth metals", *J. Phys. Soc. Japan* **29**, N 1, 117-131 (1970) (Eng).
- ISHIKAWA, A. and MORIYA, T., "Magnons, excitons and light scattering in antiferromagnetic CoF_2 ", *J. Phys. Soc. Japan* **30**, N 1, 117-128 (1971) (Eng) (P.A. 74: 16649).
- JAHN, I. R. and DACHS, H., "Change of the optical birefringence associated with the antiferromagnetic ordering of MnF_2 , FeF_2 , CoF_2 and NiF_2 ", *Sol. State Commun.* **9**, N 18, 1617-1620 (1971) (Eng).
- JONES, R. C. and EDWARDS, S. F., "Spin waves in disordered antiferromagnets", *J. Phys.* **C4**, N 10, L194-L197 (1971) (Eng).
- JOSHUA, S. J., "Dispersion relations and selection rules for magnons in antiferromagnetic NiF_2 ", *Phys. Stat. Sol.* **41**, N 1, 309-315 (1970) (Eng).
- KAJIURA, M., AOYAGI, K. and SUGANO, S., "Zero-lines and their magnon-sidebands in antiferromagnetic MnF_2 ", *J. Phys. Soc. Japan* **27**, N 1, 253 (1969) (Eng).
- KAMIMURA, H., SUZUKI, N. and WATARAI, S., "Two magnon absorption and magnon sideband in K_2NiF_4 type antiferromagnets", In: *7e conference internationale de magnetisme 1970*. Grenoble, France, 14-19 Sep 1970. Vol. 2. *J. Phys. suppl.* **32**, N 2-3, C1-1055 (1971) (Eng).
- KARAMYAN, A. A., NESTEROVA, N. N. and STEKHANOV, A. I., "Infrared absorption spectra of NaCoF_2 and NaNiF_2 antiferromagnetic crystals", *Fiz. Tverd. Tela* **11**, N 9, 2660-2663 (1969) (Russ).
- KASHCHEEV, V. N., "Critical index of phonon damping in ferro- and antiferromagnetic", *Fiz. Tverd. Tela* **13**, N 11, 3400-3402 (1971) (Russ).
- KAWABATA, A., "Theory of Raman scattering by magnetic excitations in antiferromagnetic transition metals", *J. Phys. Soc. Japan* **29**, N 4, 890-901 (1970) (Eng).
- KAWASAKI, T., "Paramagnetic spin wave excitations by light. I. Two-magnon processes", *J. Phys. Soc. Japan* **29**, N 5, 1144-1151 (1970) (Eng).
- KESTIGIAN, M. and HOLLOWAY, W. W., "The preparation, single-crystal-growth, and fluorescence studies of divalent manganese chlorides of rubidium and cesium", *Phys. Stat. Sol.(a)* **6**, N 1, K19-K22 (1971) (Eng) (P.A. 74: 60126).
- KHARCHENKO, N. F. and YEREMENKO, V. V., "Optical and magneto-optical studies of magneto-ordered dielectrics and semiconductors (ferro- and antiferromagnetic compounds of transition and rare-earth ions)", In: *Physics of condensed state N 13*. Khar'kov, 3-29 (1971) (Russ).
- KOMURA, H., "Fine structure in the absorption spectrum of Alpha-MnS ", *J. Phys. Soc. Japan* **26**, N 6, 1446-1451 (1969) (Eng).
- KOTYUZHANSKIY, B. Ya. and PROZOROVA, L. A., "Observation of magnon-phonon interaction in antiferromagnetic MnCO_3 ", *Zh. Eksp. Fiz. Pisma* **13**, N 8, 430-432 (1971) (Russ).
- KOZIBELSKI, M., POLLINI, I. and SPINOLO, G., "Multimagnon transitions in NiBr_2 and NiCl_2 ", *Phys. Rev. Letters* **27**, N 18, 1223-1225 (1971) (Eng).
- KOZŁOWSKI, G., "Influence of the field direction on the magnetic phases of a uniaxial two-sublattice antiferromagnet. I. Ground state energies, critical fields and magnetizations", *Acta Phys. Polon.* **A40**, N 3, 333-350 (1971) (Eng).
- KRZEMIŃSKI, S., "Approximate ground state of a uniaxial Néel antiferromagnet in a longitudinal magnetic field", *Acta Phys. Polon.* **A39**, N 6, 661-673 (1971) (Eng).
- LAUFER, J. C. and LEROI, G. E., "Calculation of the zero wave vector lattice frequencies of alpha- and beta-oxygen", *J. Chem. Phys.* **55**, N 3, 993-1003 (1971) (Eng) (P.A. 74: 61946).
- LORTIE, V. M. and PETROV, E. G., "Theory of spin-allowed optical transitions in antiferromagnetic oxygen", *Fiz. Tverd. Tela* **12**, N 10, 3010-3018 (1970) (Russ) (P.A. 74: 9864).
- LOUDON, R., "Theory of the temperature dependence of first-order light scattering by ordered spin systems", *J. Phys.* **C3**, N 4, 872-890 (1970) (Eng).
- MAERTENSE, I., "A note on the critical behaviour of MnCO_3 and NiF_2 ", *Solid State Commun.* **9**, N 23, 2071-2076 (1971) (Eng).
- MACFARLANE, R. M., "Exciton bands in antiferromagnetic Cr_2O_3 ", *Phys. Rev.* **B4**, N 9, 3054-3067 (1971) (Eng) (P.A. 74: 80419).
- MACFARLANE, R. M. and MORAWITZ, H., "Optical-phonon relaxation by electronic excitations in CoF_2 ", *Phys. Rev. Letters* **27**, N 3, 151-154 (1971) (Eng) (P.A. 74: 65564).
- MANGUM, B. W. and THORNTON, D. D., "Anomalous magnetic phases in antiferromagnetic GdAsO_4 ", In: *Proceedings of the twelfth international conference on low temperature physics*. Kyoto Japan, Sep 4-10, 1970, Academic Press of Japan, 321 (1971) (Eng).
- MANSON, N. B., VON DER OHE, W. and CHODOS, S. L., "Second-order Raman spectrum of MgO ", *Phys. Rev.* **B3**, N 6, 1968-1972 (1971) (Eng).
- MARZACCO, C. J. and MCCLURE, D. S., "Exchange effects on the electronic spectra of antiferromagnetic salts of Mn^{2+} ", In: *Symposium on magneto-optical effects*. London, England, 11-12 Dec 1969. London, England: Faraday Soc. 106-118 (1970) (Eng) (P.A. 74: 9861).
- MATSUI, A. and WALKER, W. C., "Exciton and interband spectra of crystalline MnF_2 ", *J. Opt. Soc. Amer.* **60**, N 3, 358-365 (1970) (Eng).
- MITLEHNER, H., GEICK, R., LEHMANN, W., WEBER, W., DIETRICH, G. and SCHOENHERR, H., "Far infrared and Raman investigation of Zn^{2+} doped MnF_2 in the two-magnon region", *Solid State Commun.* **9**, N 23, 2059-2063 (1971) (Eng).
- MITSUHASHI, H. and KOMURA, H., "Optical exciton-magnon absorption in alpha-MnS ", *J. Phys. Soc. Japan* **30**, N 3, 895-896 (1971) (Eng) (P.A. 74: 45649).
- MIWA, H., "A note on identical frequency distribution for spin waves in some close-packed lattices", *Progr. Theor. Phys. Suppl.* **N 46**, 138-146 (1970) (Eng).
- MOCH, P., MOYAL, R., DUGAUTIER, C. and GUGGENHEIM, H. J., "Impurity magnons associated with Co ions in Rh-MnF_2 ", In: *7e conference internationale de magnetisme 1970*. Grenoble, France, 14-19 Sep 1970. Vol. 2. *J. Phys. suppl.* **32**, N 2-3, C1-806 (1971) (Eng).
- MORGAN, D. and JOSHUA, S. J., "Magnon dispersion relations in antiferromagnetic $\beta\text{-MnO}_2$ ", *Phys. Letters* **36A**, N 5, 439-440 (1971) (Eng).

- MORIYA, T., "Light scattering by two-magnon excitations in ferromagnets", *Progr. Theor. Phys. Suppl.* N 46, 121-129 (1970) (Eng).
- MOSTOLLER, M., "Phonon density of states for MgF_2 ", *J. Phys. Chem. Solids* **32**, N 10, 2449-2451 (1971) (Eng).
- MOSTOLLER, M., HENDERSON, B., SIBLEY, W. A. and WOOD, R. F., "Vibronic structure and optical properties of the $m(\text{C}_{2h})$ center in MgF_2 ", *Phys. Rev.* **B4**, N 8, 2667-2675 (1971) (Eng).
- MOTIZUKI, K. and HARADA, I., "Intensity of optical absorption of Mn^{2+} ion in cubic antiferromagnet", In: 7e conference internationale de magnetisme 1970. Grenoble, France, 14-19 Sep 1970. Vol. 2. *J. Phys. suppl.* **32**, N 2-3, C1-1053 (1971) (Eng).
- MOTIZUKI, K. and HARADA, I., "Temperature dependence of the intensity of magnon sidebands in cubic antiferromagnetic manganese compounds", *Progr. Theor. Phys., Suppl.* N 46, 40-60 (1970) (Eng).
- NAGATA, K., TOMONO, Y. and KAJIURA, M., "Far infrared absorption spectrum of K_2NiF_4 and KNiF_3 at low temperature", *J. Phys. Soc. Japan* **30**, N 4, 1209 (1971) (Eng) (P.A. 74: 49560).
- NARUSHIS, Yu. P. and BATARUNAS, I. V., "Exchange interaction in exciton states of magnetic crystals", *Litovsk. Fiz. Štornik* N 6, 887-896 (1970) (Russ).
- ODAGAKI, T. and TANI, K., "Photon pumped antiferromagnetic magnon instability associated with two magnon excitation", *Phys. Letters* **36A**, N 5, 399-400 (1971) (Eng).
- OGUCHI, T., "Theory of two-magnon bound states in the heisenberg ferro- and antiferromagnet", *J. Phys. Soc. Japan* **31**, N 2, 394-402 (1971) (Eng).
- ONO, I., MIKADO, S. and OGUCHI, T., "Two-magnon bound states in linear Heisenberg chain with nearest and next nearest neighbor interactions", *J. Phys. Soc. Japan* **30**, N 2, 358-366 (1971) (Eng).
- OSEROFF, A., PERISHAN, P. S. and KESTIGIAN, M., "Raman scattering from localized magnons", *Phys. Rev.* **188**, N 2, 1046-1047 (1969) (Eng).
- PARISOT, G., DIETZ, R. E., GUGGENHEIM, H. J., MOCH, P. and DUGAUTIER, C., "Impurity concentration dependence of raman-scattering by magnons in Ni doped RbMnF_3 and KMnF_3 ", In: 7e conference internationale de magnetisme 1970. Vol. 2. *J. Phys. suppl.* **32**, N 2-3, C1-803 (1971) (Eng).
- PARKINSON, J. B., "Interaction of light with defects in antiferromagnetic perovskites", *J. Phys.* **C2**, N 11, 2003-2011 (1969) (Eng).
- PARKINSON, J. B., "Optical properties of layer antiferromagnets with K_2NiF_4 structure", *J. Phys.* **C2**, N 11, 2012-2021 (1969) (Eng).
- PASSOW, M. W., HUBER, D. L. and YEN, W. M., "Temperature dependence of the width and g -factor of the purely electronic optical transition in MnF_2 ", *Phys. Rev. Letters* **23**, N 9, 477-480 (1969) (Eng).
- PASSOW, M. W., YEN, W. M. and HUBER, D. L., "Thermal shift and broadening of the $A_{1g} \rightarrow A_{1g}$, $E_g \rightarrow E_g$ pure electronic transition in RbMnF_3 ", *Phys. Letters* **29A**, N 3, 156-157 (1969) (Eng).
- PAVLOSHCHUK, V. A. and SHANSKY, L. I., "Magnetic field effect on oxygen absorption spectrum in solid binary mixtures O_2-N_2 at 1.5°K", *Ukr. Fiz. Zh.* **16**, N 7, 1215-1217 (1971) (Russ).
- PETROV, E. G. and GAIÐIDEL, Yu. B., "Exciton-magnon optical absorption in antiferroelectrics at strong magnetic fields", *Phys. Stat. Sol.(b)* **46**, N 1, 103-106 (1971) (Eng).
- PETROV, E. G., "The exciton model of spin and optical excitations of an antiferroelectric", *Phys. Stat. Sol.(b)* **48**, N 1, 367-379 (1971) (Eng).
- PETROV, E. G., "Magnetic Davydov splitting in antiferroelectrics", *Zh. Eksp. Teor. Fiz.* **60**, N 3, 1057-1066 (1971) (Russ).
- PETROV, E. G. and LOKTEV, V. M., "Role of noncollinearity of antiferroelectric sublattice spins in exciton-exciton light absorption", *Zh. Eksp. Teor. Fiz.* **61**, N 4, 1570-1582 (1971) (Russ).
- SCHMIDT, W., "Dependence of magnon relaxation on dislocation density", *Acta Phys. Polon.* **A40**, N 4, 499-503 (1971) (Eng).
- SCHMIDT, W. and MORKOWSKI, J., "Relaxation of magnons on dislocations in uniaxial ferromagnets", *Acta Phys. Polon.* **A40**, N 5, 675-685 (1971) (Eng).
- SELL, D. D. and STOKOWSKI, S. E., "Optical absorption induced by Ca impurities in MnF_2 ", *J. Appl. Phys.* **42**, N 4, 1652 (1971) (Eng) (P.A. 74: 49566).
- SELL, D. D. and STOKOWSKI, S. E., "Optical absorption induced by Ca impurities in MnF_2 ", *Phys. Rev.* **B3**, N 9, 2844-2846 (1971) (Eng).
- SHINAGAWA, K. and TANABE, Y., "Intensity of magnon sidebands", *J. Phys. Soc. Japan* **30**, N 5, 1280-1291 (1971) (Eng).
- SIRDESHMUKH, D. B. and RAO, M. J. M., "Debye temperatures and mean amplitudes of atomic vibrations in MgF_2 and MnF_2 ", *Phys. Stat. Sol.(b)* **44**, N 2, K105-K107 (1971) (Eng).
- SMITH, J. H. and VANGE, E. R., "Diffuse magnetic scattering of neutrons from polycrystalline MnF_2 at 4.2°K", *J. Phys.* **C4**, N 13, L258-L261 (1971) (Eng).
- SÖLYOM, J., "On the two-magnon scattering of light and neutrons", *Z. Phys.* **243**, N 4, 382-393 (1971) (Eng).
- STOKOWSKI, S. E. and SELL, D. D., "Exciton-exciton transitions in MnF_2 ", *J. Appl. Phys.* **42**, N 4, 1653 (1971) (Eng) (P.A. 74: 49567).
- STOKOWSKI, S. E. and SELL, D. D., "Exciton-exciton transitions in MnF_2 ", *Phys. Rev.* **B3**, N 1, 208-214 (1971) (Eng) (P.A. 74: 37568).
- STOKOWSKI, S. E., SELL, D. D. and GUGGENHEIM, H. J., "Two-exciton transitions in MnF_2 and RbMnF_3 ", *Phys. Rev.* **B4**, N 9, 3141-3152 (1971) (Eng) (P.A. 74: 76967).
- SUGANO, S., AOYAGI, K. and TSUSHIMA, K., "Exciton absorption lines in antiferromagnetic rare-earth orthochromites—with particular reference to YCrO_3 ", *J. Phys. Soc. Japan* **31**, N 3, 706-722 (1971) (Eng).
- TANAKA, H., "Thermal behaviors of magnon side-bands in antiferromagnets", *J. Phys. Soc. Japan* **31**, N 2, 368-377 (1971) (Eng) (P.A. 74: 66046).
- TRIPATHI, R. S., KUSHWAHA, R. P. S. and SRIVASTAVA, K. G., "Magneto-electric resonance in antiferromagnets", *Solid State Commun.* **9**, N 11, 771-773 (1971) (Eng).
- TSUI, D. C., DIETZ, R. E. and WALKER, L. R., "Multiple magnon excitation in NiO by electron tunneling", *Phys. Rev. Letters* **27**, N 25, 1729-1732 (1971) (Eng).
- UESAKA, Y., TSUKIKAWA, I., AOYAGI, K., TSUSHIMA, K. and SUGANO, S., "Exciton absorption lines in antiferromagnetic DyCrO_3 ", *J. Phys. Soc. Japan* **31**, N 5, 1389-1390 (1971) (Eng) (P.A. 74: 83692).
- VIGREN, D. T. and LIU, S. H., "Long-wavelength magnons in heavy rare earths: free or frozen lattice?", *Phys. Rev. Letters* **27**, N 10, 674-676 (1971) (Eng).
- WASHIMIYA, S., "Theoretical studies of an absorption spectrum of an antiferromagnetic rare-earth garnet $\text{Dy}_3\text{Al}_5\text{O}_{12}$ ", *J. Phys. Soc. Japan* **27**, N 1, 56-66 (1969) (Eng).

- WILLIAMS, R. H. and McEVoy, A. J., "Photoemission studies of MoS_2 ", *Phys. Stat. Sol.(b)* **47**, N 1, 217-224 (1971) (Eng).
- YAMAZAKI, H., "Spin-wave relaxation in antiferromagnetic $\text{CuCl}_2 \cdot 2\text{H}_2\text{O}$ ", In: Proceedings of the twelfth international conference on low temperature physics. Kyoto Japan, Sep. 4-10, 1970, Academic Press of Japan 701-702 (1971) (Eng).
- YELON, W. B. and SILBERGLITT, R., "Renormalization of large-wave-vector magnons in antiferromagnetic CrBr_3 studied by inelastic neutron scattering: spin-wave correlation effects", *Rhys. Rev.* **B4**, N 7, 2280-2286 (1971) (Eng).
- ZAGURY, N. and REZENDE, S. M., "Theory of macroscopic excitations of magnons", *Phys. Rev.* **B4**, N 1, 201-209 (1971) (Eng).
- ZIMRING, L. J. and STOUT, J. W., "Polarized crystal spectra of CoF_2 and $\text{Co}_{0.98}\text{Zn}_{0.02}\text{F}_2$ ", *J. Chem. Phys.* **51**, N 10, 4197-4209 (1969) (Eng).

11. Molecular Crystal Structure

- AKELLA, J. and KENNEDY, G. C., "Phase diagram of benzene to 35 kbar", *J. Chem. Phys.* **55**, N 2, 793-796 (1971) (Eng).
- ANDRE, D., FOURME, R. and RENAUD, M., "Structure of monochlorobenzene crystal at 393 K and 14.2 kbars", *Acta Cryst.* **B27**, N 12, 2371-2380 (1971) (Fr).
- AUBRIOT, E., BALCOU, Y. and MEINNEL, J., "Freedom of molecular orientation in the crystal lattice and dielectric properties of trichloro-1,4,6 naphthalene", *C. R. Acad. Sci., Paris* **272B**, N 12, 747-749 (1971) (Fr) (*P.A.* 74: 40738).
- BUERGER, M. J., "Phase transformations", *Kristallografiya* **16**, N 6, 1084-1096 (1971) (Russ).
- DUMAS, G. G. and MICHEL, J., "Low frequency Raman spectrum phase transition in hexamethylbenzene", *C. R. Acad. Sci., Paris* **272B**, N 14, 836-839 (1971) (Fr).
- EDWARDS, I. A. S. and STADLER, H. P., "The crystal structure of anthanthrone", *Acta Cryst.* **B27**, N 5, 946-952 (1971) (Eng).
- GORNALL, W. S. and STOICHEFF, B. P., "Determination of the elastic constants of xenon single crystals by Brillouin scattering", *Phys. Rev.* **B4**, N 12, 4518-4535 (1971) (Eng).
- HANCOCK, P. and TEDSTONE, D. R., "Plastic deformation of benzoic acid crystals", *Phil. Mag.* **23**, N 186, 1491-1499 (1971) (Eng).
- REUCROFT, P. J., MCGHIE, A. R., HILLMAN, E. E. and DAMIANO, V. V., "Preparation and characterization of high purity chrysene crystals", *J. Cryst. Growth* **11**, N 3, 355-357 (1971) (Eng).
- SINEVICH, E. A., PERTSOV, N. V. and SHCHUKIN, E. D., "Polycrystalline naphthalene strength decrease in adsorption of surface-active substances from aqueous solutions", *Dokl. Akad. Nauk SSSR* **197**, N 6, 1376-1379 (1971) (Russ).
- SLYUSAREV, V. A. and FREIMAN, YU. A., "Thermal properties of molecular crystals", *Fiz. Tverd. Tela* **13**, N 2, 646-647 (1971) (Russ).
- VENGHAUS, H., "The dielectric tensor components of anthracene derived from energy loss experiments", *Z. Phys.* **239**, N 4, 289-299 (1970) (Eng).
- WEULERSSE, P., "Thermodiffusion of X-ray in anthracene crystal", *Acta Cryst.* **A26**, N 6, 628-635 (1970) (Fr).

12. Neutron Study of Phonon Spectra

- BAJOREK, A., JANIK, J. A., JANIK, J. M., NATKANIEC, I., STANEK, T. and WASIUTYŃSKI, T., "Lattice vibrations in crystals of hydroxides of alkali earths: $\text{Ca}(\text{OH})_2$ ", *Acta Phys. Polon.* **A40**, N 4, 431-434 (1971) (Eng).
- DAY, D. H. and SINCLAIR, R. N., "Studies of vibration spectra of bonded hydrogen atoms using a pulsed neutron source", *J. Chem. Phys.* **55**, N 6, 2807-2811 (1971) (Eng).
- GRIMM, H., "Neutron scattering experiment on the proton density distribution in paraelectric KDP", Report JUL-696-FF, Kernforschungsanlage Jülich, Germany (Sept. 1970) (*P.A.* 74: 65472).
- GUPTA, V. D. and DEOPURA, B. L., "Low frequency neutron spectrum of 1,3,5-triamino-2,4,6-trinitrobenzene", *Mol. Phys.* **19**, N 4, 589-592 (1970) (Eng).
- KJEMS, J. K., REYNOLDS, P. A. and WHITE, J. W., "Density of states measurements for phonons in aromatic crystals", In: Phonons. Université de Rennes. July 28-29 1971. Abstracts. p. F1/1.
- LEADBETTER, A. J. and LITCHINSKY, D., "Vibrational properties of vitreous germania by inelastic cold neutron scattering", *Disc. Faraday Soc.* N 50, 62-73 (1970) (Eng).
- MAKINTOSH, A. R., and BJERRUM-MOLLER, H., "Investigation of localized excitations by inelastic neutron scattering", In: Proceedings of the 1st international conference on localized excitations in solids, Irvine, Calif. USA, 18-22 Sept 1967. London, England: Plenum 721-736 (1968) (Eng) (*P.A.* 74: 16237).
- MARSHALL, W. and LOVESEY, S. W., "Theory of thermal neutron scattering: the use of neutrons for the investigation of condensed matter." (The international series of monographs on physics). Oxford: Clarendon Press; London: Oxford University Press (1971).
- PAWLEY, G. S., REYNOLDS, P. A., KJEMS, J. K. and WHITE, J. W., "A model calculation of the inelastic neutron scattering spectra from polycrystalline naphthalene", *Solid State Commun.* **9**, N 16, 1353-1357 (1971) (Eng).
- PAWLEY, G. S. and YEATS, E. A., "A neutron-diffraction study of perdeuteronaphthalene", *Acta Cryst.* **B25**, N 10, 2009-2013 (1969) (Eng).
- QUITNER, G., "The (Q, ω) transmission function of a triple-axis neutron spectrometer", *Acta Cryst.* **A27**, N 6, 605-612 (1971) (Eng).
- RAUNIO, G., *Phonons in some alkali halides investigated by neutron spectrometry.* By Gernard Raunio. [Akad. avhandl.] Göteborg (1970).
- ROWELL, J. M. and Dynes, R. C., "Comparison of phonon spectra determined from tunneling experiments and neutron scatterings", In: *Phonons*. Université de Rennes. July 26-29 1971. Abstracts. p. C5/1.

- SADIKOV, I. P., "On a possibility of neutron measuring of vibration spectrum of solids", *Fiz. Tverd. Tela* 13, N 12, 3566-3571 (1971) (Russ).
- SHIMAOKA, K., NIMURA, N. and HOSHINO, S., "A new cryostat for neutron diffraction experiments", *Jap. J. Appl. Phys.* 10, N 7, 933-935 (1971) (Eng).
- SHIRANE, G., AXE, J. D. and HARADA, J., "Inelastic neutron scattering from single-domain BaTiO₃", *Phys. Rev.* B2, N 9, 3651-3657 (1970) (Eng) (P.A. 74: 12981).
- SÓLYOM, J., "On the two-magnon scattering of light and neutrons", *Z. Phys.* 243, N 4, 382-393 (1971) (Eng).
- SPIELBERG, D. H., ARNDT, R. A., DAMASK, A. C. and LEFKOWITZ, I., "Dielectric and neutron inelastic scattering measurements on phenanthrene", *J. Chem. Phys.* 54, N 6, 2597-2601 (1971) (Eng).
- TUCCiarONE, A., LAU, H. Y., CORLISS, L. M., DELAPALME, A. and HASTINGS, J. M., "Quantitative analysis of inelastic scattering in two-crystal and three-crystal neutron spectrometry; critical scattering from RbMnF₃", *Phys. Rev.* B4, N 9, 3206-3245 (1971) (Eng).

13. Some Experimental Techniques

- ARSENIYEV, V. V., DNEPROVSKY, V. S., KLYSHKO, D. N. and SYSOEV, L. A., "Nonlinear absorption of picosecond light pulses in semiconductors", *Zh. Eksp. Teor. Fiz.* 60, N 1, 114-116 (1971) (Russ).
- CHAKRABARTI, S. K. and WARE, W. R., "Nanosecond time-resolved emission spectroscopy of 1-anilino-8-naphthalene sulfonate", *J. Chem. Phys.* 55, N 12, 5494-5498 (1971) (Eng).
- COWLEY, J. M. and KUWABARA, S., "Information of excited states of crystals from inelastic electron diffraction intensities", *Phys. Letters* 34A, N 2, 135-136 (1971) (Eng) (P.A. 74: 33531).
- DAVIS, A. R. and ADAMS, W. A., "A technique for obtaining the Raman spectra of liquids and solutions under high pressure", *Spectrochim. Acta* 27A, N 11, 2401-2405 (1971) (Eng).
- FAINBERG, B. D. and KISELYOV, B. A., "Laser absorptional analysis of strongly absorbing materials", *Opt. and Spektrosk.* 30, N 1, 168 (1971) (Russ).
- GLASGOW, L. C. and WILLARD, J. E., "Ozone filter for selecting 185-nm radiation from mercury vapor lamps", *J. Phys. Chem.* 74, N 24, 4290-4291 (1970) (Eng).
- KOPTYUG, V. A. and GRIBOV, L. A., "Application of electronic computers to molecular spectroscopy", *Zh. Prikl. Spektrosk.* 15, N 6, 1128 (Russ).
- LOW, M. J. D., MCMANUS, J. C. and ABRAMS, L., "Recording infrared spectra at low signal levels", *Appl. Spectrosc. Revs.* 5, N 1, 171-210 (1971) (Eng).
- MASARACCHIA, J. P., EGER, C. H., GREINER, M. J. and NORTON, D. A., "TEFLON—a matrix for infrared absorption spectroscopy", *Spectrosc. Letters* 4, N 6, 171-179 (1971) (Eng).
- REHM, D. and EISENTHAL, K. B., "Intermolecular energy transfer studied with picosecond light pulses", *Chem. Phys. Letters* 9, N 5, 387-389 (1971) (Eng).
- SANO, H. and KURODA, R., "Mössbauer spectroscopic studies on the inter- and intramolecular bonding of triphenyltin carboxylates", *Chem. Phys. Letters* 11, N 4, 512-514 (1971) (Eng).
- SHIMAOKA, K., NIMURA, N. and HOSHINO, S., "A new cryostat for neutron diffraction experiments", *Jap. J. Appl. Phys.* 10, N 7, 933-935 (1971) (Eng).
- SOKOLOVA, R. S. and BELKOVA, E. V., "Narrow-band reflex filters for ultraviolet", *Optics and Spectrosc.* 30, N 3, 562-565 (1971) (Russ).
- TINTI, D. S. and EL-SAYED, M. A., "New techniques in triplet state phosphorescence spectroscopy: application to the emission of 2,3-dichloroquinoxaline", *J. Chem. Phys.* 54, N 6, 2529-2549 (1971) (Eng).
- TOPP, M. R. and RENTZEPIS, P. M., "Picosecond stimulated emission in a fluorescent solution following two-photon absorption", *Phys. Rev.* A3, N 1, 358-364 (1971) (Eng).
- TOPP, M. R., RENTZEPIS, P. M. and JONES, R. F., "Time resolved picosecond emission spectroscopy of organic dye lasers", *Chem. Phys. Letters* 9, N 1, 1-5 (1971) (Eng).

14. Author Index

- | | |
|--|--------------------------------|
| ABDULNUR, S., 3, 8 | ALLEN, S. J., 10 |
| ABRAMOWITZ, S., 5, 2 | ALLISON, D. A., 3, 3 |
| ABRAMS, L., 13 | AL'SHITS, E. I., 3, 4, 6, 7, 4 |
| ADAMOWSKI, J., 9 | ALWATTAR, A. J. H., 4, 2 |
| ADAMS, W. A., 13 | AMAND, B., 3, 3 |
| AGABEKYAN, A. S., 3, 8 | AMMA, R. A., 3, 2 |
| AGARWAL, G. S., 7, 2 | AMOS, A. T., 3, 1 |
| AGRANOVICH, V. M., 7, 1, 7, 2, 7, 4, 8 | ANDERSON, C. P., 8 |
| AHRENKIEL, R. K., 3, 2, 5, 1 | ANDO, T., 7, 5 |
| AKAMATU, H., 8 | ANDRE, D., 11 |
| AKASAKA, Y., 5, 1, 6 | ANDRE, J. M., 3, 1 |
| AKELLA, J., 11 | ANGUS, J. G., 3, 2 |
| AKHIEZER, I. A., 10 | ANKINA, L. I., 3, 7 |
| AKHUTKINA, A. I., 10 | ANTIPENKO, B. M., 3, 8 |
| AL-ANI, Kh., 3, 8 | AOI, M., 3, 6 |
| AL-ANI, K., 3, 10 | AOYAGI, K., 10 |
| AL-CHALABI, A. O., 5, 3 | AOYAGI, Y., 4, 1 |
| ALAM, M., 10 | ARISTOV, A. V., 3, 6, 3, 9 |
| ALBRECHT, A. C., 3, 10 | ARMAGAN OK, H. H., 8 |
| ALEKSANDROV, A. P., 3, 2 | ARNDT, R. A., 6, 12 |
| ALFANO, R. R., 7, 1 | ARNOLD, S., 5, 1, 7, 3 |
| ALFIMOV, M. V., 3, 3, 3, 8, 3, 10 | ARSENIYEV, V. V., 13 |
| ALKHANOVA, Z. M., 7, 2 | ASAF, U., 7, 2 |
| ALLAN, C. J., 3, 3 | ASH, J., 2 |