

## Subject Index

---

### Absorption

Lyman alpha, cross-section for quenching of Hg ( $^3P_1$ ) by HD using measurements of, 463

### Absorption spectroscopy

atomic, kinetic study of O( $2^3P_J$ ) by, following flash photolysis of ozone, 69

using attenuation of resonance radiation, kinetic study of electronically excited lead atoms, Pb ( $6^1S_0$ ), by, 327

using time-resolved attenuation of resonance radiation, kinetic study of electronically excited iodine atoms, I( $5p^5\ ^2P_{1/2}$ ), by, 353

time-resolved, in the vacuum ultra-violet, kinetic study of vibrationally excited O<sub>2</sub> ( $a^1\Delta_g$ ,  $\nu = 1$ ) by, 481

### Abstraction

halogen, by hot hydrogen atoms, 426

hydrogen, by triplet state carbonyl compounds, rates of, 83

### Acetylene

reaction of S( $3^3P_J$ ) and S( $3^1D_2$ ) with, 371

### Acetone

gas-phase photolysis of, in far ultra-violet, 453

liquid, singlet energy transfer in, 379

### Alkanes

C<sub>1</sub> to C<sub>4</sub>, insertion of methylene into the C-H bonds of the, 295

### Alcohols

amino, quenching of the fluorescence of aromatic hydrocarbons by, 79

### Amines

aliphatic, redetermination of rate constants for the quenching of O<sub>2</sub> ( $^1\Delta_g$ ) by, 163

### Aromatic hydrocarbons

quenching of the fluorescence of, by amino alcohols, 79

### Aromatic ketones

temperature dependence of some type II photofragmentations of, 471

### L-Ascorbic acid

primary processes in the methylene blue photosensitized oxidation of, 423

### Benzaldehyde

photosensitization of 1,3-pentadienes and

1,2-dichloroethylenes by, in the gas phase, 289

### Benzene

energy transfer from single vibronic levels of, 345

### Benzene-*d*<sub>6</sub>

primary photophysical processes in, 417

### Benzene vapour

substituent effects in photochemistry of, 97

### Benzenes

trifluoromethyl, photochemistry of, 397

### Biacetyl

effect on photoperoxidation of unsaturated organic molecules, 283

### Biphotonic reactions

quantitative studies of, 225

### Bonds

carbon-hydrogen, of the C<sub>1</sub> to C<sub>4</sub> alkanes, insertion of methylene into, 295

### Borazine

*N*-trimethyl, energy transfer processes in, 153

### Carbazole

determination of dipole moment value of the first excited singlet state for, from solvent effects, 443

### 2-Carbomethoxy-2-butene

photochemical *cis-trans* isomerization of, 433

### Carbon

quantum yield of C( $^1D$ ) and CH in the photolysis of methane, 171

### Carbon dioxide

photolysis of NO at 2139 and 2265 Å in the presence of, 11

### Carbon monoxide

Hg( $^1P_1$ ) sensitized photolysis of, 181  
photochemistry of gaseous H<sub>2</sub>O<sub>2</sub>-CO system, 1

### Carbonyl compounds

triplet state, rates of hydrogen abstraction by, 83

### Charge transfer

to solvent band in the spectrum of Ru(CN)<sub>6</sub><sup>4-</sup> ion in aqueous solution, 197

### 9-Cyanoanthracene

quantum yield of triplet state formation of, in three solvents, 429

- Cyanogen bromide  
flash photolysis of, in excess Xe, vibrational inversion of CN produced by, 317
- Cyanogen iodide  
photodissociation of, 75
- Dibenzofuran and dibenzothiophene  
determination of dipole moment values of the first excited singlet state for, from solvent effects, 443
- 1,2-Dichloroethylenes  
photosensitization of, by benzaldehyde in the gas phase, 289
- Dipole moment values  
of the first excited singlet state for carbazole, dibenzofuran and dibenzothiophene, determination of, from solvent effects, 443
- Electronic excitation  
of Na by vibrationally excited N<sub>2</sub>, 23
- Electron spin resonance  
kinetic, photochemical application of, 83
- Energy transfer  
electronic-vibrational, in the reaction of O(<sup>1</sup>D) atoms with molecular oxygen, 241  
from single vibronic levels of benzene, 345  
singlet, in liquid acetone, 379
- Energy transfer processes  
in *N*-trimethyl borazine, 153
- Exciplexes  
intramolecular, formation of by derivatives of 1-methylnaphthalene, 491
- Excitation  
electronic, of Na by vibrationally excited N<sub>2</sub>, 23
- Flash photolysis  
of BrCN in excess Xe, vibrational inversion of CN produced by, 317  
of ozone, kinetic study of O(<sup>2</sup>P<sub>J</sub>) by atomic absorption spectroscopy following, 69
- Flash photolytic production  
of FCO radical in the gas phase, 147
- Fluorescence  
of aromatic hydrocarbons by amino alcohols, quenching of, 79  
of NO<sub>2</sub>, quenching of, 203
- Formyl fluoride radical  
flash photolytic production of, in the gas phase, 147
- f*-value  
corrected, for the CH<sub>2</sub>(<sup>3</sup>A<sub>2</sub>-<sup>3</sup>B<sub>1</sub>) transition, 337
- Halogen abstraction  
by hot hydrogen atoms, 426
- Hydrazoic acid  
reaction of NH(<sup>a</sup>Δ) with, 255
- Hydrocarbons  
aromatic, quenching of the fluorescence of, by amino alcohols, 79
- Hydrogen  
halogen abstraction by hot hydrogen atoms, 426
- Hydrogen abstraction  
by triplet state carbonyl compounds, rates of, 83
- Hydrogen deuteride  
cross-section for quenching of Hg(<sup>3</sup>P<sub>1</sub>) by, using measurements of Lyman alpha absorption, 463
- Hydrogen peroxide  
photochemistry of gaseous H<sub>2</sub>O<sub>2</sub>-CO system, 1  
rate constants for hydroxyl radical reactions with H<sub>2</sub>O<sub>2</sub> and isobutane by competitive kinetics, 1
- Hydrogen thiocyanate  
photodissociation of, in the near ultraviolet, 363
- Hydroxyl radical reactions  
with hydrogen peroxide and isobutane by competitive kinetics, rate constants for, 1
- Inversion  
vibrational, of CN produced by flash photolysis of BrCN in excess Xe, 317
- Intramolecular exciplexes  
formation of by derivatives of 1-methylnaphthalene, 491
- Iodine atoms  
electronically excited, I(5p<sup>5</sup> <sup>2</sup>P<sub>1/2</sub>), kinetic study of some chemical reactions by atomic absorption spectroscopy using time-resolved attenuation of resonance radiation, 353
- Iodine cyanide  
photodissociation of, 75
- Isobutane  
rate constants for hydroxyl radical reactions with H<sub>2</sub>O<sub>2</sub> and isobutane by competitive kinetics, 1
- Isomerization  
photochemical *cis-trans*, of 2-carbomethoxy-2-butene, 433
- Ketones  
aromatic, temperature dependence of some type II photofragmentations of, 471

- Kinetic study**  
 of electronically excited iodine atoms,  $I(5p^5\ ^2P_{1/2})$ , by atomic absorption spectroscopy using time-resolved attenuation of resonance radiation, 353  
 of electronically excited lead atoms,  $Pb(6^1S_0)$ , by absorption spectroscopy using attenuation of atomic resonance radiation, 327  
 of  $O(2^3P_J)$  by atomic absorption spectroscopy following the flash photolysis of ozone, 69  
 of vibrationally excited  $O_2(a^1\Delta_g, \nu = 1)$  by time-resolved absorption spectroscopy in the vacuum ultra-violet, 481
- Kinetics**  
 competitive, rate constants for hydroxyl radical reactions with  $H_2O_2$  and isobutane by, 1  
 of photochemical reactions, 471
- Lead atoms**  
 kinetic study of electronically excited lead atoms,  $Pb(6^1S_0)$ , by absorption spectroscopy using attenuation of atomic resonance radiation, 327
- Lifetime measurements**  
 on excited  $SH(A^2\Sigma^+)$  radicals, 177
- Lyman alpha absorption**  
 cross-section for quenching of  $Hg(3P_1)$  by HD using measurements of, 463
- Mercury**  
 cross-section for quenching of  $Hg(3P_1)$  by HD using measurements of Lyman alpha absorption, 463  
 $Hg(1P_1)$  sensitized photolysis of  $N_2$  and CO, 181
- Methane**  
 photolysis of, 171
- Methylene**  
 corrected  $f$ -value for the  $CH_2(3A_2-3B_1)$  transition, 337  
 insertion of into C-H bonds of the  $C_1$  to  $C_4$  alkanes, 295
- Methylene blue photosensitized oxidation**  
 of L-ascorbic acid, primary processes in, 423
- Methylenecyclobutane**  
 gas-phase photolysis of, at 147.0 and 123.6 nm, 271
- Naphthalene**  
 1-methyl, formation of intramolecular exciplexes by derivatives of, 491
- Nitric oxide**  
 photolysis of, at 2139 and 2265 Å in the presence of  $CO_2$ , 11  
 quenching rate constant for  $O(^1S) + NO$ , 341
- Nitrogen**  
 $Hg(1P_1)$  sensitized photolysis of, 181  
 vibrationally excited, electronic excitation of Na by, 23
- Nitrogen dioxide**  
 quenching of the fluorescence of, 203
- 1,3-Pentadienes**  
 photosensitization of, by benzaldehyde in the gas phase, 289
- 3-Pentanone**  
 photolysis of, 387
- Photochemical application**  
 of kinetic electron spin resonance, 83
- Photochemical *cis-trans* isomerization**  
 of 2-carbomethoxy-2-butene, 433
- Photochemical reactions**  
 kinetics of, 471
- Photochemistry**  
 of benzene vapour, substituent effects in, 97  
 of the gaseous hydrogen peroxide-carbon monoxide system, 1  
 of trifluoromethyl benzenes, 397
- Photodissociation**  
 of HNCS in the near ultra-violet, 363  
 of ICN, 75
- Photofragmentations**  
 type II, of aromatic ketones, temperature dependence of some, 471
- Photolysis**  
 flash, of BrCN in excess Xe, vibrational inversion of CN produced by, 317  
 of ozone, kinetic study of  $O(2^3P_J)$  by atomic absorption spectroscopy, 69  
 gas-phase, of acetone in the far ultra-violet, 453  
 of methylenecyclobutane at 147.0 and 123.6 nm, 271  
 $Hg(1P_1)$  sensitized, of  $N_2$  and CO, 181  
 liquid-phase, semi-micro apparatus for, 333  
 of methane, 171  
 of NO at 2139 and 2265 Å in the presence of  $CO_2$ , 11  
 of ozone, 39  
 of 3-pentanone, 387  
 of  $SO_2$  at 123.6 nm in the presence of  $H_2$ , 321
- Photolytic production**  
 flash, of FCO radical in the gas phase, 147
- Photoperoxidation**  
 of unsaturated organic molecules, 283

- Photophysical processes  
 primary, in benzene-*d*<sub>6</sub>, 417
- Photosensitization  
 of 1,3-pentadienes and 1,2-dichloroethylenes by benzaldehyde in the gas phase, 289
- Photosensitized oxidation  
 methylene blue, of L-ascorbic acid, primary processes in, 423
- Photosensitized production  
 of O<sub>2</sub>(<sup>1</sup>Σ<sub>g</sub><sup>+</sup>), 307
- Primary processes  
 in methylene blue photosensitized oxidation of L-ascorbic acid, 423
- Oscillator strength value  
 corrected, for the CH<sub>2</sub>(<sup>3</sup>A<sub>2</sub>–<sup>3</sup>B<sub>1</sub>) transition, 337
- Oxygen  
 electronic–vibrational energy transfer in the reaction of O(<sup>1</sup>D) atoms with molecular, 241  
 kinetic study of O(<sup>2</sup>³P<sub>J</sub>) by atomic absorption spectroscopy following the flash photolysis of ozone, 69  
 kinetic study of vibrationally excited O<sub>2</sub>(a<sup>1</sup>Δ<sub>g</sub>, ν = 1) by time-resolved absorption spectroscopy in the vacuum ultraviolet, 481  
 photosensitized production and physical quenching of O<sub>2</sub>(<sup>1</sup>Σ<sub>g</sub><sup>+</sup>), 307  
 quenching rate constant for O(<sup>1</sup>S) + NO, 341  
 redetermination of rate constants for the quenching of O<sub>2</sub>(<sup>1</sup>Δ<sub>g</sub>) by aliphatic amines, 163
- Ozone  
 flash photolysis of, kinetic study of O(<sup>2</sup>³P<sub>J</sub>) by atomic absorption spectroscopy following, 69  
 photolysis of, 39
- Quantum yield  
 of triplet state formation of 9-cyanoanthracene in three solvents, 429  
 of C(<sup>1</sup>D) and CH in the photolysis of methane, 171
- Quenching  
 of the fluorescence of aromatic hydrocarbons by amino alcohols, 79  
 of the fluorescence of NO<sub>2</sub>, 203  
 of gaseous O<sub>2</sub>(<sup>1</sup>Δ<sub>g</sub>) by aliphatic amines, redetermination of rate constants for, 163  
 of Hg(<sup>3</sup>P<sub>1</sub>) by HD using measurements of Lyman alpha absorption, cross-section for, 463
- Quenching (*continued*)  
 physical, of O<sub>2</sub>(<sup>1</sup>Σ<sub>g</sub><sup>+</sup>), 307
- Quenching rate constant  
 for O(<sup>1</sup>S) + NO, 341
- Radicals  
 CN, produced by flash photolysis of BrCN in excess Xe, vibrational inversion of, 317  
 excited SH(A<sup>2</sup>Σ<sup>+</sup>), lifetime measurements on, 177  
 FCO, flash photolytic production of, in the gas phase, 147  
 NH(a<sup>1</sup>Δ), reaction with HN<sub>3</sub>, 255
- Rate constants  
 for hydroxyl radical reactions with hydrogen peroxide and isobutane by competitive kinetics, 1  
 for quenching of gaseous O<sub>2</sub>(<sup>1</sup>Δ<sub>g</sub>) by aliphatic amines, redetermination of, 163  
 for quenching of O(<sup>1</sup>S) by NO, 341
- Rates  
 of hydrogen abstraction by triplet state carbonyl compounds, 83
- Resonance radiation  
 atomic, kinetic study of electronically excited iodine atoms, I(5p<sup>5</sup> <sup>2</sup>P<sub>1/2</sub>), by absorption spectroscopy using time-resolved attenuation of, 353  
 kinetic study of electronically excited lead atoms, Pb(6<sup>1</sup>S<sub>0</sub>), by absorption spectroscopy using attenuation of, 327
- Ruthenium hexacyanide ion  
 CTTS band in the spectrum of, in aqueous solution, 197
- Singlet energy transfer  
 in liquid acetone, 379
- Singlet state  
 first excited, determination of dipole moment values of, for carbazole, dibenzofuran and dibenzothiophene, from solvent effects, 443
- Sodium  
 electronic excitation of, by vibrationally excited N<sub>2</sub>, 23
- Substituent effects  
 in photochemistry of benzene vapour, 97
- Sulphur  
 reaction of S(<sup>3</sup>P<sub>J</sub>) and S(<sup>3</sup>D<sub>2</sub>) with acetylene, 371
- Sulphur dioxide  
 photolysis of, at 123.6 nm in the presence of H<sub>2</sub>, 321

- Tellurium  
  direct observation of  $\text{Te}(5^1\text{D}_2)$ , 86
- Temperature dependence  
  of some type II photofragmentations of aromatic ketones on, 471
- N*-Trimethylborazine  
  energy transfer processes in, 153
- Triplet state formation  
  of 9-cyanoanthracene in three solvents, quantum yield of, 429
- Vibrational inversion  
  of CN produced by flash photolysis of BrCN in excess Xe, 317
- Vibronic levels  
  of benzene, energy transfer from single, 345