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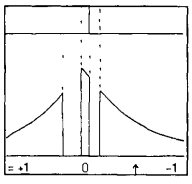
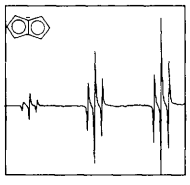


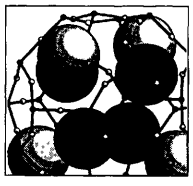
BRUKER LECTURE. The Nuclear Zeeman Interaction in Electron Resonance
By N. M. Atherton (pp. 293–298)

In recent years it has become possible to make electron paramagnetic resonance (EPR) measurements at very high magnetic fields. This opens up the possibility that there will be an increase in the number of interesting cases in which the hyperfine and Zeemman energies in paramagnetic species are comparable. With this scenario in mind the role of the nuclear Zeeman energy in a variety of continuous wave and pulsed single and multiple electron resonance experiments is reviewed.



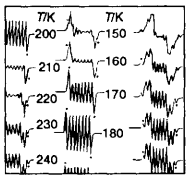
The EPR Spectra of Organic Radical Ions *By Alwyn G. Davies* (pp. 299–304)

The study of organic radical ions during the 1950s and 1960s has been referred to as the golden age of EPR spectroscopy. The technique can map out electron distribution in much the same way as NMR spectroscopy can map out proton distribution, and it has a synergistic relationship with MO theory. The review describes modern practice for obtaining and interpreting the EPR spectra of radical anions and cations in solution, and illustrates the information the technique continues to provide about the nature of these important species.



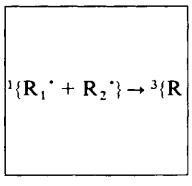
On the Possibility of an Insulator–Metal Transition in Alkali Metal-Doped Zeolites
By P. P. Edwards, P. A. Anderson, A. R. Armstrong, M. Slaski, and L. J. Woodall (pp. 305–312)

The authors briefly review the geometric and electronic structure of new solids formed by 'dissolving' alkali metals in zeolites. Here the incoming alkali atoms readily give up their *ns* valence electron to the solid in return for a framework coordination site for the resulting cation. The authors argue that the metal doping of zeolites is reminiscent of the situation in metal–ammonia solutions and doped semiconductors (*e.g.* P in Si). The possibility exists that, at some critical stage of alkali metal loading, a 'matrix-bound' Insulator-to-Metal Transition occurs within the zeolite host. ESR, NMR, and magnetic susceptibility measurements provide important information on the electronic properties of these remarkable materials.



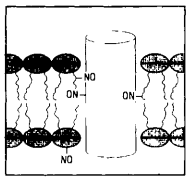
Some Aspects of the Electron Paramagnetic Resonance Spectroscopy of *d*-Transition Metal Compounds *By F. E. Mabbs* (pp. 313–324)

This review deals with both the commonly and not so commonly occurring interactions which effect the experimental EPR spectra of *d*-transition metal complexes. The main emphasis is on CWEPR. The discussion is divided into three sections: (1) Magnetically dilute mononuclear paramagnets. The emphasis here is on the effects of the point symmetry at the metal. (2) The effects of surrounding paramagnets. The discussion is confined to homonuclear dimers in fluid solution and to undiluted solids. (3) Ligand hyperfine interactions. The use and limitations of CWEPR, and of ENDOR and ESEEM to overcome these limitations, are briefly discussed.



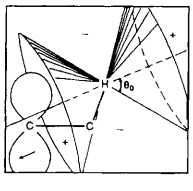
Why can Transient Free Radicals be observed in Solution using ESR Techniques?
By Keith A. McLauchlan (pp. 325–328)

A systematic discussion is provided of the methods used to produce free radicals for study by ESR methods. It is based upon the fact that radicals are produced in spin-correlated pairs and obey strict spin selection rules on reaction. Some principles for optimizing the concentration of free radicals are provided, and the implications to free radical chemistry noted.



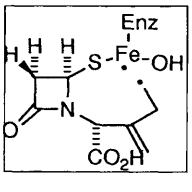
Progressive Saturation and Saturation Transfer ESR for Measuring Exchange Processes of Spin-Labelled Lipids and Proteins in Membranes *By Derek Marsh* (pp. 329–335)

Continuous wave ESR spectroscopy of spin-labelled species is sensitive to molecular rate processes occurring on the timescale of the nitroxide spin–lattice relaxation, which lies in the microsecond regime. The experiments fall into two classes: either the progressive saturation of the conventional ESR spectrum, or recording of the saturation transfer ESR spectrum that is detected in phase quadrature under conditions of partial saturation. Rate processes that may be studied in this way are slow two-site exchange and weak Heisenberg spin exchange. Applications include those to the study of biological membranes.



Polarized Positive Muons Probing Free Radicals: A Variant of Magnetic Resonance
By E. Roduner (pp. 337–346)

What is an elementary particle which is classified as *anti*-matter and constitutes the main component of our exposure to cosmic rays on Earth good for in chemistry? Its microsecond lifetime makes it too elusive to allow the production of bottles of new compounds. Nevertheless, the exotic particle forms the nucleus of an atom which is chemically well behaved. It can be substituted for protons in molecules where it acts as a spy, radiating off information of interest to the chemist.



The Chemistry of Cyclopropylmethyl and Related Radicals *By Derek C. Nonhebel* (pp. 347–359)

The use of ring opening rearrangement of cyclopropylmethyl radicals to but-3-enyl radicals as radical clocks and as probes of reaction mechanism is discussed in relation to a variety of both enzyme-catalysed and chemical reactions. Similar studies using heterocyclic analogues, *e.g.* oxiranylmethyl radicals, are also reported. Factors which influence both the rate and regioselectivity of ring opening of cyclopropylmethyl and related radicals have been analysed. The use of this rearrangement in synthetic methodology has also been surveyed.

Articles that will appear in forthcoming issues include

TILDEN LECTURE. Organometallic Intermediates: Ultimate Reagents **R. N. Perutz**

Enantioselective and Diastereoselective Molecular Recognition of Neutral Molecules **T. Webb and C. S. Wilcox**

Amplitude Vibrations in Electronic Spectra of Organic Molecules in a Supersonic Jet **J. M. Hollas**

The Hydrogen Bond and Crystal Engineering **C. B. Aakeröy and K. R. Seddon**

Electrochemistry in Media of Low Dielectric Constant **A. Abbott**

Mechanisms of Solvolytic Alkene-forming Elimination Reactions **A. Thibblin**

Water Purification by Semiconductor Photocatalysis **A. Mills, R. H. Davies, and D. Worsley**

The Properties of Organic Liquids that are Relevant to their Use as Solvating Solvents **Y. Marcus**

Magnetic Field Gradients in NMR: Friend or Foe? **T. J. Norwood**

Helical Poly(isocyanides) **R. J. M. Nolte**

INDUSTRIAL LECTURE. Polyelectrolyte Materials–Reflections on a Highly Charged Topic **J. W. Nicholson**

The Kirkwood–Buff Theory of Solutions and its Application **K. E. Newman**

Tetrathiafulvalenes as Building-blocks in Supramolecular Chemistry **T. Jørgensen, T. H. Hansen, and J. Becher**

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