# Book Review

*NMR, NQR, EPR and Mössbauer Spectroscopy in Inorganic Chemistry*

By R. V. Parish, Ellis Horwood Series in Inorganic Chemistry, Series Editor: J. Burgess, published by Ellis Horwood, Chichester, U.K., 1990, SBN 13-625518-3

The book is intended to provide an introduction to the interpretation of the NMR, NQR, EPR and Mössbauer spectra of inorganic compounds. It is aimed for practicing chemists, therefore it keeps the theory to a minimum and focuses on the procedures which are needed in order to abstract chemical information out of complex spectra.

The first chapter is a general introduction to the four techniques, stressing the common feature of hyperfine (electron–nucleus) interactions which provide a common background to all of them.

Chapter two is about NMR, with information on the active nuclei, the procedure of sample preparation, the spectrometer, the chemical shift, the coupling constants, with the complications associated with higher order spectra. The chapter is completed by a survey on the $^{1}H$, $^{31}P$, $^{13}C$, $^{19}F$, $^{27}Al$, $^{29}Si$ spectra. The more recent techniques, including two dimensional NMR, INDOR, DEPT, INEPT and DANTE sequences of pulses are briefly mentioned.

Chapter three is about NQR, with information on the foundations of the technique, on the interpretation of the spectra of halogens, Group V elements, and transition metals.

Chapter four is devoted to Mössbauer spectroscopy, with indication of the isotopes in common use, of the scheme of the experimental setup, and of the appearance of spectra with and without an external magnetic field applied. The interpretation of spectra is discussed in detail for $^{57}Fe$, $^{119}Sn$, $^{121}Sb$, $^{127}I$, $^{129}I$, $^{193}Ir$, $^{197}Au$. Finally brief mention is made to more complex spectra.

The last chapter is devoted to EPR, with experimental considerations on sample preparation and on the spectrometer, on the fundamentals of the technique ($g$ values, fine structure anisotropy effects, hyperfine and superhyperfine structures). The chapter is completed by a survey of experimental results on radicals, $d^1$, $d^9$ and $d^5$ systems, and very brief mention is made to multi-electron systems.

All the chapters are completed by problems, with answers. Three appendices report the properties of isotopes for NMR, NQR and Mössbauer spectroscopy.

The book is rather simple to read, and in slightly more than 200 pages it covers four different techniques. It is obvious that the coverage of the matter is rather superficial. I feel it can be useful for undergraduate students who want to get a first impression on the techniques without much effort. Whether they can actually confront themselves with real systems after reading the book is more dubious.

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