

RECENSIO

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Mössbauer Spectroscopy

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Approximately twenty years have passed since the discovery of the Mössbauer effect. During this time the Mössbauer effect has proved to be a rather versatile and simple nuclear method to study different effects in physics, chemistry and biology. The amount of literature describing the uses of the Mössbauer effect has steadily increased over the years. The knowledge has reached such a level that there is a pronounced need for new authoritative monographs.

The present volume complements the existing ones. Naturally, new points of view had to be considered when the material for a new treatise was selected. The main topic discussed in this book is the application of Mössbauer effect to the study of quick frozen solutions and inorganic chemistry. The choice may be considered quite natural because the authors have contributed substantially to these fields.

The book starts with an introductory Chapter on the physical basis of Mössbauer spectroscopy. The authors point out how the Mössbauer effect can be used to determine many important parameters, such as isomeric shift, quadrupole splitting and magnetic interactions. A very essential part of this Chapter is its discussion of how information, related to the electronic structure of molecules can be obtained from the theoretical evaluation of the measured Mössbauer parameters. A portion of this Chapter also deals with the techniques of measurements.

In the second Chapter the application of Mössbauer spectroscopy in inorganic chemistry is reviewed. Different aspects of the coordination chemistry of iron, tin, antimony and ruthenium complexes are discussed in great detail. The application of Mössbauer spectroscopy in the analytical chemistry of inorganic materials, including such samples as minerals, rocks and even lunar and extraterrestrial specimens, is also demonstrated.

The treatment of the Mössbauer effect in frozen solutions is introduced by a systematic review of the experimental results which show that in the majority of cases the rapid freezing of a solution does not change its chemical composition; therefore the Mössbauer effect can be used to study the chemistry of liquid systems. Hydration, solvation, complex formation, electron exchange and hydrolysis are the topics in which the Mössbauer effect has been fruitfully applied.

The last two Chapters provide a survey of the applications of the Mössbauer effect in biology and metallurgy. The Chapter on biological applications contains a useful systematic presentation of the extensive literature.

The reviewer is convinced that research workers interested in the chemical and biological applications of Mössbauer spectroscopy will profit substantially from this book.

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