

BOOK REVIEW

Attila Vértes and Dénes L. Nagy (Editors): *Mössbauer Spectroscopy of Frozen Solutions*

Akadémiai Kiadó, Budapest, 1990, p. 303

Mössbauer spectroscopy is a method suitable typically for the study of solid samples. It is based namely on the recoilless X-ray resonance absorption which can be achieved only in systems where both source and absorber are fixed tightly in a solid matrix.

The specificity of this method and the low line width of the Mössbauer lines (near to the natural line width determined by the uncertainty principle) led to a great variety of chemical and physical informations unattainable or very difficult to attain with other methods of investigation. Because of the basic importance of chemical and physical phenomena in solutions several attempts have been made to use this powerful research method for the study of solutions. Liquid solutions have been quenched therefore by quick-freezing them and the Mössbauer parameters of the resulting ice served as information sources. The assumption was that using a high freezing rate amorphous glacial-like ice was formed in which the near surrounding of the Mössbauer active solute could be considered identical or at least analogous with that in the original solutions.

Hungarian scientist played an initiative role in the elaboration of the above technique. I. Dézsi and L. Keszthelyi were among the firsts who studied frozen solutions by Mössbauer spectroscopy. A. Vértes (the senior editor of this book) has been working for over 20 years on the application of Mössbauer spectroscopy in the study of frozen solutions. His research results laid the basis of the extensive use of this solid state structural method in solution chemistry.

The book presents in details the results of Mössbauer studies of frozen systems. The editors have selected the most authoritative experts to cover the different subjects of the field.

The physical and technical basis are reviewed by D. L. Nagy, as well as the short range order studies in frozen aqueous iron(II) salt solutions, relaxation phenomena in frozen solutions are presented by S. Morup, after effects of nuclear transformation by S. V. Bondarevski and F. S. Nasredinov and selected studies in glassy materials by P. P. Seregin and H. A. Andreev. The most extensive and for the reviewer the most interesting part of the book written by A. Vértes deals with the Mössbauer investigations of solution structures.

The richness of the material presented, the great number of instructive examples and the detailed reference list after the end of each Chapter make the book of great value for everybody interested in Mössbauer spectroscopy, solution and structural chemistry.

The intriguing question how to use a solid state investigation method in solution chemistry has been answered by the authors. Their work will initiate further research activity in this important field.

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