

Book Review

"X-Ray and Neutron Structure Analysis in Materials Science"

Edited by J. Hašek, Plenum Press, New York, 1989. xii + 406 pp, \$89.50 (%107.40 outside US and Canada), ISBN 0-306-43107-6.

This volume consists of 53 papers selected from 160 active contributions presented at the conference "Advanced Methods in X-ray and Neutron Structure Analysis of Materials" held in Karlovy Vary (Czechoslovakia) on October 5-9, 1987. Twenty experts review the present state of the science and outline prospects for science and technology in three different areas of X-ray and neutron structure analysis - phase analysis of materials, thin films and surface coatings, and crystal structure determination of modulated and polytype structures. Other papers provide a survey of microstructure characterization techniques, with special emphasis on crystalline materials. Topics covered:

- powder diffraction analysis (13 papers)
- diffraction analysis of amorphous materials, glasses and polymers (5 papers)
- real structure of crystalline materials (6 papers)
- polycrystal thin layers (12 papers)
- single crystal thin layers (4 papers)
- crystal structure determination (8 papers)
- data acquisition (5 papers).

Of special interest for people working in powder diffractometry will be the first four sections.

The principal subject of the first section is the identification of materials and quantitative phase analysis of powder materials. Four papers (by J. Fiala, B. L. Davis, A. Griger, S. Popovič and B. Gržeta) provide a sufficient theoretical background and a comprehensive review of the newest developments in the methodology of quantitative analysis of mixtures. The following nine contributions add a number of significant applications to metals, their corrosion products, alloys, garnets, industrially important minerals and minerals deposited in the human body. The section ends with papers dealing with the optical simulation of diffraction patterns.

The second section is devoted to structure determination of amorphous materials and polymers. Highly interesting are the structure models of amorphous alloys given by L. Rang-Su. The neutron structure analysis of amorphous $\text{Fe}_{75}\text{B}_{25}$ and tellurite glasses are undoubtedly of great interest and practical impact. X-Ray analysis of styrene-methacrylate copolymers and polypropylene fibers close this section.

An introduction to the investigation of the real structure of powder materials in the third section is given by P. Klimanek. Six papers in this section offer examples of studies of different structure defects, texture and interdiffusion in solids using a wide spectrum of systems (rolled FeSi, materials for microelectronics and minerals).

The last section to be reviewed in detail gives a comprehensive view of polycrystalline thin films and surface coatings. The first paper by R. I. Barabash and M. A. Krivoglaz summarizes the theoretical aspects of scattering by thin surface layers influenced inevitably by different types

of defects and stresses. An extensive methodological treatment of a number of specific systems is given in papers by H. Oettel, V. Valvoda, E. L. Haase, R. Delhez, J. Pielaszek and I. Tomov. From the material point of view, one can find interesting structure analyses of laser-modified surface layers of alloys, analyses of ceramic coatings, nitrided steels, TiC, SnOx, and others, with applications in microelectronics as resistors or potentiometers in hybrid circuits, or as diffusion barriers in integrated circuits. They can be used further as selectively transmitting coatings on architectural glass, in jewelry production, as thermal-resistant and wear-resistant coatings on cutting tools and as anticorrosive and antiabrasive coatings with interesting applications.

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ICDD Announces Results of Board of Directors Election

The International Centre for Diffraction Data is pleased to announce the results of the 1990 Election of Directors.

Ludo K. Frevel, formerly of Dow Chemical Company, Midland, Michigan, and now a Research Fellow of Johns Hopkins University, Baltimore, Maryland, was elected to a two-year term as Chairman of the Board of Directors. Jan W. Visser, formerly of the Technisch Physische Dienst, Delft, the Netherlands, was elected to a two-year term as Vice Chairman. Elected to four-year terms as Members-at-Large were Gerhard R. Fischer of Corning Incorporated, Corning, New York, and Robert L. Snyder of Alfred University, Alfred, New York.

Voting for a third Member-at-Large resulted in a tie between Ting C. Huang, IBM Research Division in San Jose, California, and James A. Kaduk, Amoco Corporation in Naperville, Illinois. Members of the ICDD attending the Annual Meeting on March 22, 1990 will ballot to resolve the tie.

Continuing as Members-at-Large until 1992 are Allan Brown of Studsvik Energiteknik AB, Nykoping, Sweden, and Mary F. Garbaskas, GE Company, Schenectady, New York. Deane K. Smith, the Pennsylvania State University, University Park, Pennsylvania, serves on the Board of Directors as Past Chairman.

Leaving the Board of Directors are Gregory P. Hamill, GTE Laboratories, Waltham, Massachusetts; C. M. Foris, E. I. duPont de Nemours and Company, Wilmington, Delaware; Peter L. Wallace, Lawrence Livermore Laboratory, Livermore, California, and Gregory J. McCarthy, North Dakota State University, Fargo, North Dakota.