

Book Review

EXPERIMENTAL TECHNIQUES OF TEXTURE ANALYSIS, edited by H. J. Bunge. Deutsche Gesellschaft für Metallkunde, Oberursel (1986).

This book contains the proceedings of a workshop held at Technische Universität Clausthal from March 25 to 29, 1985. It serves to introduce the reader to the variety of experimental techniques which find application in texture analysis, and at a source of references (382) for collateral reading.

The book contains 35 papers by 58 authors representing 26 institutions and 8 countries. It is divided into 6 sections: General Experimental Methods and Instrumentation; Special Experimental Methods; Neutron Diffraction Texture Analysis; Electron Diffraction Texture Analysis; Texture Measurements in Special Materials; Texture Stress Analysis.

The first section begins with a contribution by the editor, which serves as an introduction and review of the subject. This is followed by a discussion on sources of experimental error in the determination of pole figures by x-ray diffraction, by descriptions of texture goniometers, and by a discussion of graphical representation.

Special Experimental Methods includes discussion of energy-dispersive x-ray diffraction for inverse pole figure measurements, texture determination by individual orientation measurements and by optical methods, texture topography, determination of non-centrosymmetric pole figures by anomalous scattering, and on-line texture measurements.

Neutron Diffraction Texture Analysis begins with an introductory review by P. I. Welch. This is followed by discussions on the use of position-sensitive detectors, applications of neutron time-of-flight diffraction, a two-axis goniometer for fiber-textured samples, and the effect of the pole-figure "window".

Electron Diffraction Texture Analysis includes contributions on electron diffraction pole-figure measurements, on-line texture determination by Kikuchi or channeling patterns and the determination of orientation correlation functions in fiber composites.

Texture Measurements in Special Materials contains discussions of orientation measurements on Zircaloy, effect of texture on grain boundary properties, applications to rapidly solidified metals, inter-metallic phases, epitaxial layers, low-carbon steel sheet, and anisotropic absorption in multiphase texture analysis.

Texture Stress Analysis includes contributions on diffraction systems for texture and stress analysis, a position sensitive detector for texture and lattice deformation pole figures, the determination of macro and microstrains in textured material by x-ray diffraction and ultrasonics.

The reviewer was particularly impressed by: C. Esling and H. J. Bunge, "Determination of Non-Centrosymmetric Pole Figures by Anomalous Scattering"; P. I. Welch, "Neutron Diffraction Texture Analysis"; E. Jansen *et al.*, "Application of Profile Analysis Methods in Texture Measurements Using Position-Sensitive Detectors"; B. Plege, "The Determination of Orientation Correlation Functions in Two Phase Fibre Composites"; R. Maurer and H. Gleiter, "Investigation of Grain Boundary Properties by Means of Texture Measurements".

This book should be most useful to readers having some prior knowledge of texture analysis, since many of the writers assume the reader has some familiarity with the subject.

PETER R. MORRIS