



Journal of Research

of the

National Institute of Standards and Technology

January - February 2004, Vol. 109, No. 1 ISSN 1044-677X

Special Issue: Accuracy in Powder Diffraction III - Part 1



NIST

National Institute of Standards and Technology

Technology Administration, U.S. Department of Commerce

Available online
<http://www.nist.gov/jres>

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¹At Boulder, CO 80303

²Some elements at Boulder, CO

Journal of Research of the **National Institute of Standards and Technology**

Volume 109

Number 1

January–February 2004

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Cover: Sectional view of a 3D representation for the reciprocal lattice of a powder. Superimposed upon it are the incident and diffracted wave vectors and the reciprocal lattice vector. Illustration arranged by C. Carey.

The *Journal of Research of the National Institute of Standards and Technology*, the flagship periodic publication of the national metrology institute of the United States, features advances in metrology and related fields of physical science, engineering, applied mathematics, statistics, biotechnology, and information technology that reflect the scientific and technical programs of the Institute. The *Journal* publishes papers on instrumentation for making accurate measurements, mathematical models of physical phenomena, including computational models, critical data, calibration techniques, well-characterized reference materials, and quality assurance programs that report the results of current NIST work in these areas. Occasionally, a Special Issue of the *Journal* is devoted to papers on a single topic. Also appearing on occasion are review articles and reports on conferences and workshops sponsored in whole or in part by NIST.

ISSN 1044-677X

Coden: JRITEF

Library of Congress Catalog Card No.: 89-656121

United States Government Printing Office, Washington: 2004

Accuracy in Powder Diffraction III—Part 1

Preface

With the continuing advancements in the powder diffraction technique, a broad-based review conference was warranted. Accordingly the IUCr Commission on Powder Diffraction, in conjunction with the National Institute of Standards and Technology and the International Centre for Diffraction Data organized a third Accuracy in Powder Diffraction, APD-III, for April 22-25, 2001, following the successes of similar conferences held in 1979 and 1992. The proceedings of the conferences remain highly referenced to this day. For this reason, it was decided to publish within the Journal of Research of the National Institute of Standards and Technology.

The number of papers was too large to be published within a single issue of the Journal, so papers were divided, on a somewhat arbitrary basis, between the issue you are viewing, and a subsequent issue. Given the numerous new developments in powder diffraction methodology, the conference length was increased to four days, but still there was too little time for adequate oral presentation of many important topics, for example quantitative analysis. However, an extensive poster session was held and authors of posters were invited to submit extended abstracts, which will appear in the subsequent volume of these proceedings.

The conference was organized in five sessions: Instrumentation, Optics Characterization and Powder diffraction Techniques, Metrology, Structure Solution and Refinement, Phase Identification and Quantification, and Microstructure, Lattice Defects and Residual Stress. In addition to a poster session, a 2 hour period was set aside for a “round table” discussion of issues pertaining accuracy and methodology in powder diffraction. This proved to be a most successful exchange, limited only by available time.

We, the organizers, enjoyed financial support from a range of organizations, both non-commercial and commercial, which was critical to success of this meeting. We also wish to thank the session organizers, all of those individuals who worked on the various committees, and Kathleen Kilmer and the staff of NIST Conference Program whose hard work assured the success of this meeting.

James P. Cline
Brian H. Toby
Jeffrey E. Post
Paolo Scardi

Special Issue Editors

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