Additions and Corrections

Homolysis of Carbenes. Free Radicals from Dialkoxycarbenes [*J. Am. Chem. Soc.* **1998**, *120*, 11182−11183]. PAUL C. VENNERI AND JOHN WARKENTIN*

Regrettably we were not aware of the following work: Hoffmann, R. W.; Hirsch, R.; Fleming, R.; Reetz, M. T. *Chem. Ber.* **1972**, *105*, 3532−3541. Hoffmann et al. had generated similar carbenes, in the gas phase, and found products derived from radicals. We thank Professor Hoffmann for drawing our attention to that important paper.

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Book Reviews

Chemistry of Advanced Materials. An Overview. Edited by Leonard V. Interrante (Renssalaer Polytechnic Institute) and Mark J. Hampden-Smith (University of New Mexico). Wiley-VCH: New York. 1998. v + 580 pp. $89.95. ISBN 0-471-18590-6.

In the literature, "advanced" and "materials" seem like twin buzzwords joined at the hip in the introductory paragraphs of articles. In recent years, chemists have grown increasingly interested in applying molecular level understanding to problems in advanced materials design, manufacture, and analysis. Challenges in materials science and engineering (MS&E) arise from its highly interdisciplinary nature (the chemist generally must interact with scientists and engineers with disparate backgrounds), and the great breadth of materials and processes which garner the appellation "advanced material". Inspection of the volume reveals chapters dealing with superconductors, polymers, nonlinear optical (NLO) materials, chemical vapor deposition (CVD), nanoporous materials, and biomaterials. The editors have brought together leading researchers in these and other fields with three major goals: first, "to remind chemists and chemical engineers about their intimate connections with MS&E"; second to provide "non-experts with a basic background in chemistry" an entrée into advanced materials; third, to emphasize future research areas in MS&E. As someone who approaches this book with experience in several subject areas and no experience in the remainder, it is my opinion that the editors and authors have been successful in achieving their goals. For example, I have a better understanding of "nonchemical" issues like reactor design in CVD and new ways of thinking about NLO properties. Likewise, I found out much that was completely new to me, for example, the utility of nanostructural materials and issues relevant to their synthesis and characterization, and the myriad chemical, biological, and clinical issues in development of new biomaterials. I believe the current volume is a useful addition to the library of those who wish to view MS&E from a chemist's viewpoint.

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Advances in X-ray Analysis. Volume 39. Proceedings of the Forty-fourth Annual Conference on Applications of X-ray Analysis, July 31 to August 4, 1995, Colorado Springs, CO. Edited by John V. Gilfrich, I. Cev Noyan, Ron Jenkins, Ting C. Huang, Robert L. Snyder, Deane K. Smith, Mary Ann Zaitz, and Paul K. Predecki. Plenum Press: New York. 1997. xvii + 908 pp. $175.00. ISBN 0-306-45803-9.

This volume contains a hundred concise articles on current analytical X-ray research and applications by a diverse group of international authors. In commemoration of the 100th anniversary of the discovery of X-rays by Wilhelm Roentgen, the first seven papers review the history of X-ray science and technology. Four of the reviews, dominated by the editors, highlight historical technical developments and progress in X-ray diffraction (XRD) and spectrometry instruments, techniques, and software. The other reviews trace the development of X-ray analytical equipment by three different instrument manufacturers.

Fourteen papers describe new X-ray beam technologies and instrument developments. X-ray beam focusing is described with parabolic and elliptical graded multilayer optics, multicapillary and nested conic elements, tapered monocapillaries, cylindrically bent modulated crystals, and pyrolitic graphite. Instrument developments include use of focused beams in conventional and grazing incidence XRD, X-ray microfluorescence, and trace analysis, and large area parallel X-ray beams for X-ray lithography. Laser-induced pulsed Cu X-rays were used for time-resolved X-ray diffraction.

The largest group of papers, totaling 34, addresses the problems of stress and strain determination by XRD and related methods. Residual stress measurements are described for coarse grained materials, particle size estimates, thin films, fibers, surface coatings and treatments, multiphase composites, and fatigue fractures. Several papers describe methods and software for diffraction peak broadening analyses.

Six papers describe X-ray and neutron diffraction methods for characterizing amorphous and poorly crystallized polymers, fiber morphology, bitumens, and coal dusts, and to determine the structures of crystallized high-density polyethylene and borate glasses. Six others address precision and accuracy from round-robin tests, analyses of instrument-related peak shifts, reference intensity calculations, and XRD and phase analyses of smectites, superconductors, and thin films.

Thin film characterization by diffraction and fluorescence methods is described in eleven papers. Topics include film deformation, interfaces, multiple layer thicknesses, single-crystal stresses, organic film growth, total electron yields, light elements, and thin film standards. High-temperature X-ray diffraction studies of smectite expansions, alloy melting, superconductor phase equilibria, and intermetallic compound alloys are described in five other papers.

Trace element analysis is described in six papers on total-reflection X-ray fluorescence (XRF) sources, samples, detectors, standards, light element analyses, and small-spot XRF analyses of solution residues. Quantitative XRF and new applications are described by the last eleven papers, including fundamental parameter methods, X-ray cross section measurements, high-accuracy analyses, and analyses of glasses, carbon, zinc sulfide, and biological specimens. New instrument developments include ultrathin windows for proportional counter detectors, elemental depth profiling, and an XRF cone penetrometer sensor.

Except for occasional typos by authors and editors, this volume continues the excellent tradition of this series. It contains over 600 illustrations and over 1200 literature references (nearly half from the 1990s, and about a fourth citing the authors' own work). It is an authoritative and valuable resource for scientists and technicians working in any area of X-ray technology, instrumentation, materials science, or applied spectroscopy.

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