Acta Cryst A FOUNDATIONS ADVANCES

ISSN 2053-2733

International Tables for Crystallography, Volume I, X-ray absorption spectroscopy and related techniques. Edited by C. T. Chantler, F. Boscherini and B. Bunker. Wiley, 2024, Hardcover, Pp. XIV+1074, price EUR 395.50. Hardcover: ISBN 978-1-119-43394-1.

Keywords: book review; X-ray absorption spectroscopy; International Tables for Crystallography.

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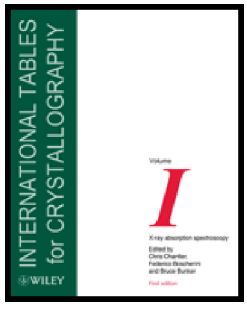

It has been nearly 30 years since the IUCr Commission on XAFS (X-ray Absorption Fine Structure) was established as a way to promote the development of standards and criteria in XAFS measurements and to increase the interactions between researchers in the XAFS field and other groups in the IUCr. The present volume is one outgrowth of that effort. The editors of Volume I have assembled a large team of international experts to prepare over 150 chapters dealing with all aspects of X-ray spectroscopy, which is, for the purpose of this volume, interpreted more broadly to include both X-ray absorption, emission and inelastic scattering. The volume is impressive in both its breadth and depth, and should be widely useful, both to researchers in the field and to researchers in related fields who may wish to add X-ray spectroscopic methods to their toolbox (there are even a couple of chapters aimed at making specific connections between X-ray crystallographic and spectroscopic methods).

Roughly half of the volume is devoted to theory and experimental methods. The former section has some outstanding summaries of the different theoretical approaches that are used to make sense of X-ray spectra. It would not really work as a textbook (nor is it intended as one), since each of the chapters is a stand-alone description of some aspect of theory (often written by the authors most closely associated with its development). This means that there is a fair amount of redundancy with different chapters describing the same phenomenon from slightly different perspectives (and sometimes with different nomenclature). This minor weakness is more than offset by the fact that this section brings together in one place summaries of all of the principal theoretical approaches to understanding X-ray spectra: electronic structure theory (density functional theory and multiplet theory), multiple scattering theory, Green's function approaches, and other methods. Researchers who need to know more about a particular approach will find this a useful starting point.

The ∼50 chapters on experimental methods contain detailed discussions of both experimental equipment (monochromators, detectors *etc*.) and the different approaches that are used for different kinds of samples. Again, while there is some redundancy, one can imagine individual chapters being used by new experimenters to understand the detailed reasons behind the practical experimental advice that they found at the beamline. Particularly helpful is a set of chapters (Part 4) devoted to various sorts of experimental errors. Careful consideration of this section could help new (and established) experimenters to avoid unreliable data.

Several chapters are devoted specifically to different approaches to data analysis. As before, there is some redundancy, and not all of the chapters describe methods that are widely used in current research. Nevertheless, one can easily envisage sending a new student to this section to learn about the details of, for example, different statistical approaches.

One of the highlights of the volume, in my view, is the section devoted to different data analysis systems. Twenty-five of the most common X-ray spectroscopy programs are described. While it is impossible to keep such a section current (the links to at least one package are already broken), this is a tremendously useful compilation of the different

software packages that are available. It collects together in a single location the details about how (and why) to use different programs. One can see this being useful both for new experimenters wanting to know what package to use, and also for experienced researchers wanting to understand what was described in a particular article.

The last major section is devoted to various applications of X-ray spectroscopy. Although this is inevitably limited in scope (how can one possibly describe the thousands of papers on biological, earth-science or materials-science applications of X-ray spectroscopy in only a few pages), these chapters should prove quite useful to users from outside X-ray spectroscopy who want to understand what the technique might do for them. These give a good, if inevitably incomplete, indication of the ways in which X-ray spectroscopy can help to answer key questions in a range of different fields. Novice researchers interested in these different applications will find numerous suggestions for ways that they might be able to use X-ray spectroscopy to answer their research questions.

Across the volume, one of its key advantages is that it provides a concise, up-to-date reference for different aspects of X-ray spectroscopy. It is a convenient way to point students, collaborators and readers to the key concepts that underlie X-ray spectroscopy. I anticipate it being highly cited.