

## News Article

**Kenji Sakurai, News Editor**

New Japanese book on reference-free X-ray fluorescence analysis (November 6, 2019)

Recently a new book entitled “Introduction to Reference-Free X-ray Fluorescence Analysis” has appeared in the bookstores in Japan. As the intensity of X-ray fluorescence from each element is influenced by the matrix, not only by the concentration and/or the amount of the element of interest, a set of reference samples, which have similar matrix, are usually used to prepare a calibration curve for quantitative analysis. The necessity of correction of the influences from coexisting elements is quite common in any other chemical analysis. However, since 1955, pioneered by J. Sherman, physical mechanism of matrix effects in X-ray fluorescence analysis has been clarified, and the X-ray fluorescence spectra can be reproduced by the use of X-ray fundamental parameters (FP) and the modelling for the sample. The reference-free X-ray fluorescence analysis is a method, which attempts to replace the experimental calibration curve using a set of reference samples by the theoretical calibration curve. In the context of ability of reference-free analysis, at present, X-ray fluorescence analysis is a top runner among many other methods for determination of chemical composition. To realize reliable reference-free analysis, it is absolutely necessary that all the physical processes of the measurement and the characteristics of the instrument are well understood, most of which can be expressed by theoretical formulas, and the measurement results corresponding to the chemical composition of the sample is enough predictable. The latest X-ray fluorescence analysis satisfies this under some conditions. In addition, X-ray fluorescence analysis has many advantages such as flexibility of the measurement atmosphere/environment, easy sample preparation, rapid analysis, and, furthermore, as it is nondestructive analysis, the measured samples can be reanalyzed by other analytical methods. Because of such attractive features, the application fields

of X-ray fluorescence analysis are expanding, and now the spectrometers and the obtained data are handled by nonexperts of X-ray analysis. It has become more important to share technical information useful for ensuring the reliability of reference-free X-ray fluorescence analysis. The book is published for this aim. The book consists of four chapters. Chapter 1 is “Basics of Reference-Free X-ray Fluorescence Analysis,” which explains the physical principle, instruments and historical progresses. In Chapter 2, “Application examples of reference-free X-ray fluorescence analysis”, in 10 sections, a number of examples of application are introduced and explained. In Chapter 3, “Remarks on Reference-Free X-Ray Fluorescence Analysis,” many problems, which could happen in the workplaces, are sorted out, and explained in detail. Chapter 4 is “Toward Reference Reliability XRF Analysis with Higher Reliability,” which explains the significance of the use of certified reference materials as a reliability tool (not for building an experimental calibration curve), as well as experiences in the round robin test achieved by the authors of this book. The future of the reference-free X-ray fluorescence analysis is also discussed. The book has an appendix, which is a list of resources (including latest information on FP) useful for the reference-free X-ray fluorescence analysis. The book is edited by K. Sakurai, and is published from Kodansha. For further details, see <https://www.kspub.co.jp/book/detail/5135983.html>

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**Kenji Sakurai, News Editor**

**The 8<sup>th</sup> X-ray reflectivity school in Japan** (March 2, 2020).

Demand for learning analytical techniques for surfaces and interfaces appears to be on the increase. In Tsukuba, Japan, the 8<sup>th</sup> tutorial course on the analysis of thin films and multilayers by X-ray reflectivity was held on March 2. As the new edition of Japanese textbook on the introduction to X-ray reflectivity was recently published, the 6 authors gave lectures as part of the course. Further information is available at <http://xray-neutron-buried-interface.jp/> (in Japanese only).

**Postponing and cancellation of conferences by coronavirus (COVID-19)** (March 14, 2020).

The March Meeting of the American Physical Society (APS) had been cancelled due to rapidly escalating health concerns over coronavirus COVID-19. The American Chemical Society (ACS) and the Materials Research

Society (MRS) made the same decision. The ICDD's XRF Clinic has also been cancelled. The organizing committee of EXRS-2020 has decided to postpone the next EXRS conference with one 1 year. The EXRS-2020 will therefore become "reborn" as EXRS-2021, which will take place from Sunday 27 June 2021 to Friday 2 July 2021 at Bruges, Belgium.

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**1 | AMERICAN PHYSICS SOCIETY  
VIRTUAL APRIL MEETING (APRIL  
21, 2020)**

While almost all national and international conferences were cancelled due to the worldwide pandemic caused by coronavirus COVID-19, the American Physics Society's April Meeting has been held virtually from April 18 to 21, 2020. The conference was broadcasted to the world by internet. Not only the APS members but also non-members were able to make registration for free of charge. The scope of the meeting is something like astrophysics, particle physics, nuclear physics, gravitation, and so on, but all lectures delivered by such a unique style were impressive even for X-ray scientists. The number of audience was displayed for each talk, and was sometimes over 1,000. Comments from the audience appeared in the chat menu. This meeting's great success could give strong

influence on the future of academic conferences. Further information on the APS virtual April Meeting is available at <https://aps-april.onlineeventpro.freeman.com/>.

**2 | DENVER XRAY CONFERENCE  
2020 TO BE VIRTUAL (MAY 14, 2020)**

ICDD and the Conference Organizing Committee have made the decision that the Denver X-ray Conference will be held virtually from August 3 to 7, 2020. Further information is available at <http://www.dxcicdd.com/>.

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## Obituary—Charles Wu (July 17, 2020)

### Kenji Sakurai, News Editor

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Charles Tsai-Way Wu, a very famous and popular instructor in XRF course in Ontario, Canada, died due to heart attack at the age of 70. The sad news was shared immediately in the XRF-L mailing list, where many messages on valuable memory were contributed by his friends. The obituary written by Maggi Loubser on behalf of the Charles Wu's group is found in the Web site of

London X-Ray Consulting group LLC, <http://www.londonxrayconsultinggroup.com/Charlie%20Wu.pdf>.

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## Virtual Denver X-ray conference ended in success (August 7, 2021)

Kenji Sakurai, News Editor

The 69<sup>th</sup> Denver X-ray Conference was held 3-7 August 2020, as a virtual event due to the COVID-19 pandemic. At the stage of March 2020, almost all national/international conferences had been canceled or just postponed to more than one year later. In April, American Physics Society's meeting was a great success, by being organized as a very large-scale virtual conference, that any physicists from all over the world were able to join virtually from their offices by using internet. Because of this strong impact, after summer 2020, many conferences and meetings are planned in a similar manner. The decision of the organizers of the Denver X-ray Conference was earlier than other major conferences. The chosen style was slightly different from that of the above APS April meeting. All oral presentations were prerecorded videos, i.e., MP4 files. The conference was organized on an event app, *Whova* (see, <https://whova.com/>) that allowed participants to attend the meeting on either their PC or mobile device. Each day of conference week, new workshops and sessions premiered. Over 350 registered attendees connected through the app to watch and

discuss the pre-recorded video presentations, including virtual exhibits from 21 companies. Attendees joined the conference from all over the world, with 40% participating from outside the USA; a 10% higher international attendance than the past conferences. The advantage of the virtual conferences is that it made it possible to attend without travelling, which eased the access from much wider geographic region in the world than before. On the other hand, one of the future tasks for the virtual meetings will be enhancing interactions between the speaker and the audience. It is also necessary to develop some good ways for attractive and interactive exhibitions. For further information, visit the Web page, <http://www.dxcicdd.com/20/summary.htm>

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