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Microscopy AND Microanalysis



# Introduction

This issue of *Microscopy and Microanalysis* contains papers from the Seventh Regional Workshop of the European Microbeam Analysis Society (EMAS) on Electron Probe Microanalysis of Materials Today—Practical Aspects that took place May 13–16, 2006 in Karlsruhe, Germany. The meeting was organized in collaboration with the Institute for Transuranium Elements (ITU) of the Joint Research Centre of the European Commission.

The EMAS Regional Workshop is a biennial event designed to provide postgraduate students, researchers, and technicians in materials science and engineering with basic knowledge of the capabilities and limitations of electron probe microanalysis (EPMA). The Workshop is arranged as a low-cost meeting with lectures on practical and theoretical aspects of EPMA given by internationally recognized experts. The content of the meeting is tailored to the needs of the practical microanalyst routinely dealing with the problems of specimen preparation, instrumental procedures, data collection, and quantification, as well as the needs of researchers keen to deepen their understanding of the physics underlying X-ray production, measurement, and analysis. The workshops have a very distinctive format comprising invited lectures delivered by eminent scientists, poster presentations by the participants, and roundtable discussions on the key topics led by experts in the field. Previous workshops in the series were held in Finland (1994), Hungary (1996), Spain (1998), The Czech Republic (2000), Poland (2002), and Slovenia (2004).

Since at ITU X-ray microbeam analysis is carried out on irradiated materials, in particular irradiated nuclear fuel, the Workshop program was somewhat different from previous ones in the series. In addition to the usual tutorial lectures on EPMA, two technical sessions dedicated to X-ray microbeam analysis of nuclear materials were included in the program. For these two sessions EMAS invited speakers on the following topics: applications of quantitative X-ray mapping in the characterization of nuclear materials, microanalysis of nuclear samples at the synchrotron, SIMS as an alternative to EPMA for the analysis of nuclear fuel, X-ray photoelectron spectrometry of actinide materials, the practicalities of microbeam analysis of highly radioactive materials, the role of microbeam analysis in combating smuggling of nuclear materials, EPMA of retained fission gas in irradiated nuclear fuel, and EPMA of actinide elements.

The Karlsruhe Workshop attracted 71 participants from 11 European countries. There were 17 invited lectures, and 19 posters were displayed during the Workshop. The papers published in this issue of *Microscopy and Microanalysis* have been selected from the two sessions on microbeam analysis of nuclear materials. All the papers have been subjected to the rigorous peer review procedure of *Microscopy and Microanalysis*.

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