

**Experiment title:**

Microdiffraction on single particles

**Experiment
number:
CH128****Beamline:**

B1 1

Date of experiment:

from: 10/4 96

to: 16/4 96

Date of report:

30/8 96

Shifts:

12

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The use of a scanning X-ray microprobe for simultaneous XRF/XRD studies of fly-ash particles

*Anders Rindby, Chalmers University of Technology/Göteborg University, Sweden**Per. Engström, ESRF, France**Keen Janssens, University of Antwerp (UIA), Antwerp, Belgium**(Submitted to J of Synch Radiation)***Abstract**

With the opening of the first really "third generation" synchrotrons source in Grenoble, in fall 1994, x-ray sources of unprecedented brilliance's and qualities became available to the scientific community. Different x-ray analytical technique could now be applied on a level that was "out of imagination" only a decade ago. Here we present some preliminary results from an experiment where different analytical techniques have been applied on a μm level carried out at the most powerful synchrotrons microbeam available in the world right now, the b11 at ESRF. This beamline can now provide pm-sized x-ray beams with a flux density up to 10^{10} photons/ μm^2 at an energy of 13 keV and with a bandwidth of $10^{-4}(\partial E/E)$.

In this experiment x-ray diffraction and x-ray fluorescence has been combined in order to obtain a precise and comprehensive micro-analytical description of μ -sized fly-ash particles. These types of particles are heavily inhomogeneous with a very irregular shape which makes them inaccessible to conventional micro analysis. The experiment was done in a scanning mode and 2D images of different analytical information were reconstructed from the data recorded during the scan.

The major features and limitations of this micro-analytical technique will be outlined and different examples on how the analytical information can be used for generating 2D images of the sample will be demonstrated and discussed.

References

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Further references of interest

P. Angstrom, A. Rindby, J. Osan, S. Török, K. Janssens. *Analysis of strongly inhomogeneous samples with micro-XRF combined with scanning micro-XRD.* (presented at EDXRS-96 conf at Lisboa (June 1996).).

A. Rindby, P. Angstrom, K. Janssens. *Simultaneous Micro XRF/XRD Analysis on Highly Inhomogeneous Samples.* (invited talk at IUCr XVII conf at Seattle (Aug 1996)).