



Experiment title: TOPOGRAPHIC STUDY OF HIGHLY ORIENTED PYROLYTIC GRAPHITE FOR X-RAY IMAGING APPLICATIONS

Experiment number:
MI-268

Beamline:
BM5

Date of experiment:
from: 06 –Nov-98 7:00 to:15-Nov-98 7:00

Date of report:
14-Aug-99

Shifts:
27

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Report:

Part of the results obtained during the experiment MI-268 have been reported into a paper accepted for the publication in:

SPIE Conf. Proc. 3773, X-ray optics design, performance and applications, A. M. Khoursary, A. K. Freund, T. Ishikawa, G. Sraier and J. Lang eds, SPIE PRESS (Bellingham, Washington, USA), 1999 (in press)

A copy of the paper has been also deposited to the ESRF library in order to be enclosed in the ESRF Preprint Series.

Copies of the paper can be requested to:

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Paper title and abstract:

A comparative characterization of Highly Oriented Pyrolytic Graphite by means of diffraction topography

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and M. Ohler

ABSTRACT

Highly Oriented Pyrolytic Graphite is a very efficient and well-known x-ray and neutron monochromator. The crystal macroscopic properties are determined by its microscopic structure. Our aim is to study the crystal internal structure and correlate it with the crystal optical behaviour. We studied the texture of the crystal, in particular its spatial homogeneity, for different samples using x-ray diffraction topography. The experiment was performed at the ESRF beamline BM5 using a laminar 18 keV monochromatic beam. Several samples supplied by different manufacturers have been studied. Images of (002) reflected beam have been acquired at the Bragg angle for each sample, using a phosphor coated CCD digital detector. Contrast profiles have been obtained, and exponential fits have been performed allowing to deduce the secondary extinction coefficient. It has been found that some samples are quite perfect and the results agree with ideally imperfect crystals model. Other samples present well defined granular macrostructures (with dimensions of tens of microns) superposed to the well-known Gaussian-like crystallite distribution. The different behaviour between different samples should be explained in terms of sample internal structure, which is also related to the different graphitization process used by manufacturers.

