



	Experiment title: 3D X-ray microscopy using tomographic techniques	Experiment number: MI 356
Beamline: ID21	Date of experiment: from: 22 JAN 2000 to: 27 JAN 2000	Date of report: 28 FEB 2001
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Report:

A first experiment related to x-ray microtomography was carried out on ID21 using the Transmission X-ray Microscope (TXM). The optical scheme of the TXM is based on Fresnel zone-plates. A condenser zone-plate is used to provide homogeneous illumination of the sample. The transmission image of the sample is then magnified and projected onto a 2D CCD-based detector by a micro-zone plate acting as an objective. A spatial resolution as high as 75 nm is obtained. The microscope was operated at 4keV, energy for which it has been optimized.

A high precision rotation stage, specially designed for tomographic data acquisition, was inserted in the TXM to allow acquisition of 2D projections of the sample at different viewing angles. The experiment allowed testing the rotation stage, and establishing an alignment procedure to center the rotation axis with respect to the detector. However difficulties were encountered to position the sample on the rotation axis, in order to ensure that it remains in the field of view of the TXM (30 μm) during rotation. This is a fundamental requirement for tomographic reconstruction, and due to the bad centering of the sample, missing data prevented correct image reconstruction. A sample positioning stage has been developed since this first attempt and has proven to be reliable and reproducible in a following successful experiment (see MI460 report).