



	Experiment title: Nanochannels in track etched membranes	Experiment number: SC934
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Report:

During this experiment we have explored various type of track etched membranes. They had been irradiated either in FLNR, Dubna, or GANIL with various heavy ions. Also they differed by the etching process, either with low or high normality of NaOH, the etching agent.

This allows us to select the most interesting process.

One extremely good result was obtained with amorphous polycarbonate polymer foils irradiated in GANIL by Ca ions. The nanochannels in these samples exhibit an exceptionnal quality : many oscillations of the Bessel function characteristic of the scattering by cylinders could be observed. A paper has been presented orally at the SAS2002 conference and is now accepted for publication in Journal of Appl. Cryst[1]

[1] G. Pépy, E. Balanzat, B. Jean, A. Kuklin, N. Sertova, M. Toulemonde SAS2002 conference, accepted in Journal of Appl. Cryst.

Nanochannels in track etched membranes

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Track membranes are prepared by irradiation by energetic heavy ions. They are then etched by a suitable chemical solution, which creates uniform nearly monodisperse channels. Small angle X-ray scattering by the nanochannels gives typical spectra. New experimental protocol and data treatment allow one to obtain information about the channel diameter and dispersion, wall thickness and roughness.

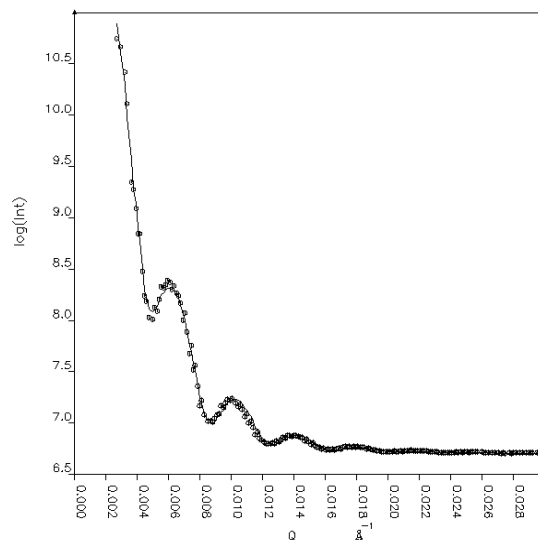


Figure 2

The pixels grouped in the filter in Fig 1 are displayed versus the wave vector Q_r . These data are fitted according to the model proposed here. The average radius R_0 is 82 nm, with a dispersion ΔR of 6 %, and a half wall thickness w of 8 nm.