

# A NEW METHOD FOR GENERATION OF TRACK ETCHED MEMBRANES FOR MICROFILTRATION AND ULTRAFILTRATION

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## ABSTRACT

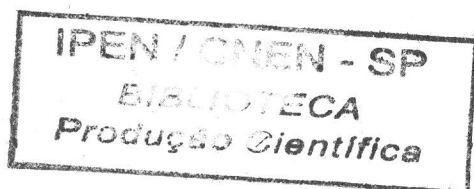
A new experimental apparatus for porous track etched membrane production has been designed, tested and installed near the core of the IEA-R1 nuclear reactor at IPEN-Sao Paulo. The thermal neutron flux close to the centre of the reactor core has been used to produce fission fragments from uranium sample which was deposited on a rod located at the centre of an evacuated aluminium chamber.

These nuclear fragments impinge on a polycarbonate film mounted on the inner cylindrical wall of the irradiation chamber. Under conditions of uniform neutron flux large areas of track etched membranes, with high level of pore uniformity, have been produced in the micro and ultrafiltration range. Membranes with pore diameters ranging from 15 to 100 nm. have been prepared reproducibly, based upon a calibration curve of track diameter versus etching time.

## OBJECTIVES

The main objectives of the present work were:

- 1) To design, construct, install and test a new irradiation device, near the IEA-R1 reactor core, for controlled production of porous membranes with high level of pore uniformity.
- 2) To study the axial profile of the thermal neutron flux at the irradiation position of the U-235 fissile sample.
- 3) To obtain a calibration curve track diameter versus etching time in the ultrafiltration region.
- 4) To produce large areas of etched track membranes with pore sizes ranging from 10 000 nm down to 15 nm and pore density in the interval from  $1.0 \times 10^5$  to  $1.5 \times 10^9$  cm<sup>-2</sup>, respectively.



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