

ABSTRACT FORM



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TITLE STUDIES ON NEUTRON DETECTION WITH ETCH-TRACK DETECTORS 1989

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Solid State Nuclear Track Detectors are in use in some laboratories for neutron fluence measurements as well as neutron dosimetry. In our laboratory neutron detection studies with dosimetric purpose have been performed using commercial plastics: LR-115, CN-85, Makrofol E and CR-39 (American Acrylics, Pershore and MOM).

Irradiations have been carried out at an Am-Be and a Cf-252 source, and at a Van der Graaf Accelerator with energies from 100 keV to 14 MeV.

The determination of etching parameters for chemical and electrochemical process was the first part of the work. The PEW (KOH, ethylic alcohol and water) solution was used for CR-39 etching with good results.

Fast neutron are detected by direct interation in plastics whereas lower energy neutrons are detected by absorption in boron or lithium, which emit an alpha particle producing a track in the detector. In order to detect neutrons at low energy experiments have been performed with four types of converters: lithium tetraborate (using LR-115B and CN-85 B Kodak films) BN Kodak converter, LiF and B<sub>4</sub>C.

The influence of polyethylene radiator and directional dependende in the fast neutron response for CR-39 and Makrofol E, have been investigated using known fluences.

The linearity and reproducibility of the responses have been verified.

The track density has been counted by eye using an optical microscope.