

Experimental Study of CN-85 Etched Track Detector for Fast Neutrons

By

T.M.Salman, T.A.Selman*and S.I.Easa
Department of physics, College of Education
**Department of physics, College of Science*
University of Basrah , Basrah, IRAQ.

Abstract:-

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The sample of plastic track detector, **CN-85**, was irradiated of fast neutrons and etching in NaOH solution. When the etching conditions were kept at 2.5 NaOH, 60 C° and 2 hr, the sensitivity was found to be 7.3×10^{-6} for Am-Be Source. From analysis of increasing rate of the sensitivity, it was found that the track density in CN-85 roughly corresponded to the density in the case of Am-Be source.

Introduction:-

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Solid state nuclear track detectors have attractive characteristics such as non-fading of latent tracks and insensitive to visible, Uv-, X-, β and γ -rays. In Particular, the thermosetting plastic **CN-85** is remarkable as a detector material because of its high sensitivity to fast neutrons and it low thresholds energy for track formation.

Many types of **CN-85** detectors are used for personal neutron dosimetry [1,2].Chemical etching are performed to enlarge latent tracks caused by nuclear reactions to etch-pits. A lot of conditions are proposed for the etching and the counting.

Aqueous solution of **CN-85 NaOH** at 60 C° are recommended for the chemical etching .The chemical etched samples are usually counted manually with optical microscopes.

The energy response of the detectors depends on the combination of these conditions intensely. Therefore, it is important to know the energy response under the adopted etching and counting conditions for accurate dosimetry.

The sensitivity of polymeric track detectors is known to be affected by various factors such as the purity of monomer, molecular structure of