

A STUDY OF GAMMA RAY AND NEUTRON IRRADIATION EFFECT ON MAKROFOL - D BY SPECTROSCOPY

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ABSTRACT:

The induced coloration in makrofol - D after being exposed to gamma rays and neutron is used as a method for measuring doses for these radiations.

A variation of the intensity of the main characteristic absorption peaks at 345 nm was observed when the samples exposed to nuclear radiations, gamma and neutron.

An empirical formulas for calculation doses for makrofol - D in the range 227.520 - 796.320 krad have been achieved.

1- INTRODUCTION

The study of optical properties of Makrofol - D is a powerful tool in our understanding the amount of damage produced in materials by nuclear radiation and recently alot of work have been done by using solid state plastic detectors as asolid state nuclear track detectors⁽¹⁻⁴⁾, since the use of such detector make some experiment possible, and widely used in a varity of experiments such as nuclear physics^(5,6), fusion research⁽⁷⁾. The latent tracks can by means of suitable chemical etching, become visible under an optical microscope. A particle can only be detected using this etching technique in an energy region where the track etching rate, V_r , is greater than the bulk etching rate V . Etching of the tracks and counting procedure⁸ have the disadvantage of being rather time consuming.

The absorption spectrum of makrofol - D is composed of one intense band in the 300 - 400 nm region.