

A COMPUTER PROGRAM FOR CALCULATION OF THE DOSE-EQUIVALENT RESPONSE OF THERMAL-NEUTRON DOSEMETERS BASED ON ELECTROCHEMICALLY ETCHED CR-39 DETECTORS.

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ABSTRACT

Following the computer programs for calculation of the dose-equivalent response of fast neutrons which we have used for the development of a fast-neutron spectrometer, we now present a computer program which is capable of calculating the dose-equivalent response of electrochemically etched (ECE) CR-39 detectors to thermal neutrons. The program, named IRFAN, is written in FORTRAN 77, and calculates the response of thermal neutron dosimeters consisting of CR-39 with type of (n,p) or (n, α) converter screen. Depending upon the type of converter screen employed, the program takes into account the reaction products resulting from the (n,p) or (n, α) reaction which generate tracks in the detector capable of being registered as ECE spots.

INTRODUCTION

The performance of the CR-39 polymeric detector has been widely investigated for use in the development of a personnel fast-neutron dosimeter (see, e.g., references 3,4). So far as we are aware, no work has been reported on the use of electrochemically etched CR-39 detectors for simultaneously recording thermal and fast neutron doses, except for a very recent paper by Matiullah and Durrani [5]. Polymeric nuclear track detectors have the advantage that they can be used for thermal-neutron dosimetry