AIN SHAMS UNIVERSITY
FACULTY OF EDUCATION
DEPARTMENT OF PHYSICS

Evaluation of Alpha tracks in LR-115 detector using locally made electronic counter and applications in Rn measurements

THESIS
SUBMITTED TO OBTAIN THE MASTER DEGREE IN TEACHER PREPARATION IN SCIENCE (PHYSICS)

By

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جامعة عين شمس
كلية التربية
قسم الفيزياء

تقدير مسارات جسيمات الفا فى كاشف LR-115 باستخدام عداد الكترونى مصنع محليا وتطبيقاته فى قياس غاز الرادون

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Title of thesis

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Contects

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DEDICATION

For all the love and well wishes, am indebted to you greatly. This work is dedicated to my father.

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Abstract

LR-115 solid state nuclear track detector was applied to measure radon concentration in some houses in two different cities in Yemen (Sana'a and Hodeidah). These cities are different in geological nature and at different altitude from the see level. The houses of the two cities are different in their architects and constructed material. The exposed films were collected after 30 days and etched in optimum condition that were previously determined in an earlier step in this work. The induced tracks density were counted using a spark counter designed and tested to the best operational condition, also in this work.

A comparison between the data obtained by the spark counter and those obtained by the traditional optical microscope method, revealed that the spark counter is not only fast and easy method but also efficient and precise as the optical microscope technique.

The radon concentration as well as the annual equivalent dose for public were determined for the first time in Yemen using LR-115.

The equilibrium factor for LR-115 was determined and compared to the previously published data and that of CR-39.

Radon resulting from the radioactive decay of uranium and thorium in the soil. Radon has no immediate health effects, but it in turn gives rise to short-lived (solid particulate) daughter products that are the main health risk [28]. A colorless, odorless, radioactive radon gas that seeps into people's houses from the underlying soil, builds up to higher levels and may cause the occupants to die from lung cancer many years later [22]. On the other hand, radon is an interesting object of research. Radon is an excellent tool of research in a variety of fields, such as tracer of resources as in the exploration of deeply buried uranium deposits [20].

Besides monitoring indoor radon concentration levels, its entry sources have to be identified. In addition to this, understanding and modeling of radon transport is also essential.

These issues have been addressed in the following sections.

1.1. Discovery of radon.

Radon is the third discovered radioactive element (after radium and polonium). It was discovered in 1898 by Friedrich Ernst Dorn. In 1900, he reported some experiments in which he noticed that radium compounds