Deanship of Graduate studies

AL-Quds University

Indoor Radon Concentration Level Measurements in South Region of West Bank / Palestine

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Abstract:

The present work deals with the measurements of radon concentrations in homes and public places specially schools in the south region part of West Bank. The study was conducted during the winter of 1999/2000. About eighty locations were included in the study. Solid-state nuclear track detectors specifically CR39 were used they left for 60 days in the places suspected of high radon emission levels. A radon work level (WL) meter type TN-WL-02 was also used in one location to doublecheck the results obtained by the CR39 detector. The films were then collected and treated with a 6.25 molar solution of NaOH at temperature 98 ± 2 °C.

Results showed a relatively high level of radon emission in certain places (above 100 Bq/m^3), although the majority of places are around the acceptable level (20 – 40 Bq/m^3). In some places the results indicated unacceptable level (40 – 100 Bq/m^3), i.e. further, comprehensive study are still needed to establish a radon emission map for the West Bank.

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2001

بسم الله الرحمن الرحيم

(يرفع الله الذين آمنوا منكم

والذين أوتوا العلم درجات)

(صدق الله العظيم)

DECLARATION

I certify that this thesis submitted for the degree of master science in physics is the result of may own research, except where otherwise acknowledged, and that this thesis (or any part of the same) has not been submitted for a higher degree to any other university or institution.

Signed:______________.

Karam Moh'd Hasan Awawdeh

Date: 30.1.2002 .

DEDICATION

To My Parents....

And Brothers

With Love

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Chapter one

Introduction, Background and Theoretical Considerations

Radiations of natural origin is widely recognized as the largest source of human exposure to ionizing radiation. The presence of the radionuclides and their decay products in the environment and in humans, results in external and internal radiation doses. The significant exposure of man comes from the two sources of alpha radiation, i.e. radionuclides in the soil and atmospheric radon daughters. Ingestion or inhalation of radon (^{222}Rn), a noble gas and decay product of ^{226}Ra in the ^{238}U series which are found in the earth's crust, is considered as a health risk (Celebi and Alkan, 1997). It plays a significant role in the induction of lung cancer in humans (Ahmed, Walkey and Tarr, 1997).

Concentration level of radon in dwelling depends on a large number of variables such as geological composition, soil properties in the house location, building materials, climate, ventilation (Pinza, Armas and Proffijn, 1997), seismology, uranium exploration and exploitation of geothermal resources. For integral measurements of radon and radon progeny concentrations in air, solid-state nuclear track detectors films (SSNTDs) are the most widely used and various counting methods of the