

**Deanship of Graduate Studies
AL-Quds University**



**Indoor Radon-222 Concentration Levels Measurements
in Sourif Dwellings During the Summer and Autumn
Seasons of the Year 2009**

Sana Azmi Ibrahim Abu Fara

M.Sc. Thesis

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Seasons of the Year 2009**

Prepared By:

Sana Azmi Ibrahim Abu Fara

B.Sc. Physics, Al-Quds University, Palestine

Supervisor: Prof. Dr. Mohammd Abu-Samreh

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Department of Physics

Faculty of Science and Technology, Al-Quds University

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AL-Quds University
Deanship of Graduate Studies
Physics Department

Thesis Approval

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Prepared By: Sana Azmi Ibrahim Abu Fara
Registration No.:20714264

Supervisor: Prof. Dr. Mohammd Abu-Samreh

Master Thesis submitted and accepted, Date:

The names and signatures of the examining committee members are as follows:

1- Head of Committee	Prof. Dr. M.Abu-Samreh	Signature.....
2- Internal Examiner	Dr. Amin Leghrouz	Signature.....
3- External Examiner	Dr. Khaleel Dabayneh	Signatur.....

Jerusalem- Palestine

1431 / 2010

Dedication

To my mother and father as they are my great supporter

and so much more.....

To my lovely family that just never stopped giving me a help...

To my lovely fiancé "Mahmud"

To my supervisor Prof. Dr. M. Abu-Samreh....

To all my teachers and friends....

With all my love

Sana Azmi Ibrahim Abu Fara

Declaration:

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

Signed:

Sana Azmi Ibrahim AbuFara

Date:.....

Acknowledgements

Thanks to Allah, the most merciful the most compassionate, who granted me the power and the ability to finish this work.

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Many thanks go to my nice parents, to my fiancé, to my brothers and to my sisters for their encouragements and support.

Thanks are extended to Dr. Khaleel Dabayneh from Hebron University for providing me with detectors.

So many thanks go to my friends and doctors their support. Special sincere thanks and gratitude's to homeowners and inhabitants who granted me the opportunity to complete this study, by allowing me to distribute the detectors in their flats and homes.

Abstract

In this study, we are basically aimed on investigating indoor and outdoor radon-222 concentration levels in some dwellings chosen randomly from six regions in Sourif city during time period between August 1 of the 2009 to January 31 of the year 2010 using Solid State Nuclear Tracks (SSNTDs) or (CR-39 detectors). The results showed that the indoor radon-222 concentration levels vary from 6.29 to 857.05 Bq/m³, with an average value of 73.03 Bq/m³; while the outdoor concentration levels were found to vary between 6.12 to 89.38 Bq/m³, with an average value of 33.57 Bq/m³. The effective doses equivalents vary from 0.11 to 14.83 mSv/y, respectively.

Higher average values of indoor radon concentration levels were found in bathrooms (104.96 Bq/m³) and storages (103 Bq/m³); while relatively lower values of 78.24 and 64.6 Bq/m³ were detected in bedrooms and kitchens respectively. The lowest average indoor radon concentration levels of 54.77 Bq/m³ were detected in living rooms.

The concentration levels were found to be higher in lower floors (the first floor) than that of higher floors (second floor). Moreover, concentration levels are found to be higher in old buildings than the newly constructed ones.

The indoor radon concentration levels were found to vary from location to another. A noticeable differences between the minimum and maximum concentration levels results in each region had been detected. These variations are mainly due to the ventilation, geological characteristics of soil, and the types of raw building materials, are also the age of dwellings.

The outdoor radon concentration levels were found to be lower than the indoor concentration levels. This is because the outdoor dosimeters were placed in an open places where air can exchange easily between the dosimeter and the outside. That is, the radon gas can diffuse easily with the atmosphere and the possibility for being trapped is very low.

2009 (²²²Rn)

		(²²² Rn)			
		2009	,		
(CR-39)		(SSNTDs)			,2010
857.05	³ /	6.29			
89.38	6.12		³ /	73.03	, ³ /
0.11			³ /	33.57	, ³ /
			, /	14.83	/
103	³ /	104.96			
78.24					, ³ /
54.77	;		³ /	64.6	³ /
					, ³ /

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