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INSTITUTUL DE CERCETĂRI INTERDISCIPLINARE ÎN BIO-NANO-ȘTIINȚE
Str. August Treboniu Laurian Nr. 42
CLUJ – NAPOCA, RO-400271
TEL. 0264 454554
E- mail : secretariat.icibns@ubbcluj.ro
Web: bionanosci.institute.ubbcluj.ro

Doctoral (Ph.D.) Dissertation Review

on **Mohammademad Adelikhah's** doctoral thesis manuscript titled **"Numerical and Experimental Investigation of Radon and Progeny in Residential Areas"**, which was prepared in the frame of the **Doctoral School of Chemistry and Environmental Sciences at the University of Pannonia** with the supervision of **dr. Kovács Tibor**

The topic of this thesis is attempted to cover the important issues of exposure to radon and its decay products and dose assessment of some areas in Iran with different natural background ionizing radiation. It includes the previous situation, the challenges presented by the changing regulation, a possible solution for the situation, and the suitability of the used general dose assessment calculations, with a short excursion to the possibility of using studied the building materials and corresponding the external gamma radiation emanating from building materials which population is expose to. Besides that, the author has implemented the numerical method to compare and visualize the indoor radon and decay products.

The thesis is written in 116 pages and well organized in 4 chapters plus bibliography and reflects conventional construction. The literature outline reflects the applicant's professional and scientific preparedness. The representation of the introduction part (general and measurement bases) is emphasized within the impression on the thesis work. Beside that the construction of the whole work is logical and systematic, each practical part (measurement result) is immediately followed by its assessment.

The author found out the relatively high radon and thoron concentration in some parts of Iran and he has performed a radiological impact assessment for building materials to estimate and control the radiological effects on the public and on the environment which are very critical

and sensitive effort due the criteria of sustainable development. As he mentioned, these informations are important and might be useful for Iranian Authority due to helps to establish a new radiological safety standard and implementing radiation protection measures and it even could be more improved by measuring radioactivity in other building materials from other cities specifically local products which contains higher radioactivity.

Only comments are related to the firstly, increase the number of houses in which the measurements are carried out to be more accurate estimation, and secondly about RESRAD code in numerical simulation of indoor doses, clarify the significance of the results obtained by RESRAD code, as well as its potential applications.

Finally, data in the thesis are given according to the publications. He could use 4 papers as his original research what is more than enough to underline the thesis. The scientific presentation of the dissertation is enough strong while, the database is very valuable and suitable to obtain a PhD degree. Hence, dissertation is in the form to be accepted.

I am glad to state, the dissertation written by **Adelikhah Mohammademad** fulfils all the conditions for gaining a PhD degree in chemistry and environmental sciences doctoral school, University of Pannonia, Hungary and reached the scientific level of the degree required.

Date: Cluj-Napoca, 13.03. 2023

Asoc.Prof. dr. Begy Robert-Csaba