

Measurement of radon exhalation rate in NORM used as consumer products

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Content

Materials containing a significant amount of natural radionuclides are referred to as Naturally Occurring Radioactive Material (NORM). The necessity of regulations that control human exposure to NORM was pointed out in the International Commission of Radiological Protection Publication 60 (ICRP, 1991). In Japan, a guideline for control of materials containing uranium and thorium was published by the Ministry of Education Culture, Sports, Science and Technology in 2009. Recently, consumer products such as clothes, water purification reagent, wristband, bedrock bath instruments and hot spring instruments that contain natural radionuclides have predominantly been commercially available in Japan. Although the activity concentration of natural radionuclides such as U-238, Ra-226, Ra-228, K-40 in these consumer products and dose estimation of users handling them has been reported in the past, radiological information on their radon exhalation is rare. In this study, consumer products, such as clothes, water purification reagent, wristband, bedrock bath instruments and hot spring instruments containing natural radionuclides, currently distributed in Japan were collected, and radiological characterization on the radon exhalation was carried out. Determination of the radon exhalation rates in the samples was carried out using the can technique. The passive detector with CR-39 was fixed at the top and center of a chamber. The samples were placed at the bottom and center of the chamber. The chambers were sealed and stored for 1 month. After the 1 month, the detectors were taken out, etched, and counted for alpha tracks. The radon mass exhalation rates were calculated from the alpha tracks, chamber volume, exposure time and sample mass. We will present the metrological results on radon exhalation rates in consumer products including NORM.

About the Presenter

Kazuki Iwaoka, Ph.D. is an assistant professor at Hirosaki University in the Department of Radiation Physics and specializes in radiation measurements. In 2010, Dr. Iwaoka earned his Ph.D. in sciences from Chiba University. Throughout his career he has been involved with radiation research at the National Institute of Radiological Sciences, Ministry of Health labor and Welfare in Japan, and Hirosaki University. Dr. Iwaoka has developed continuous radon bronchial dosimeter. He is currently working on dose estimation of general public handling NORM and regulatory science about limits for food contaminated with radionuclides.

Primary author(s) : Dr. IWAOKA, Kazuki (Hirosaki University)

Co-author(s) : Dr. HOSODA, Masahiro (Hirosaki University Graduate School of Health Sciences); Prof. TOKONAMI, Shinji (Hirosaki University)

Presenter(s) : Dr. IWAOKA, Kazuki (Hirosaki University); Dr. HOSODA, Masahiro (Hirosaki University Graduate School of Health Sciences)

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