Radon levels due to volcanic activities of Mt. Sakurajima

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The high polonium-210 concentrations from Mt. Sakurajima volcano have been observed on 1980s. Polonium-210 is generated from radon-222 by radioactive decay. The radon-222 concentration may also be possibly high when the high polonium-210 concentration was observed. The WHO proposed a reference level of indoor radon gas ranging from 100 to 300 Bq m-3, and its inhalation is supposed to increase the risk of lung cancer after tobacco smoking. Radon is generated from soil, rocks, groundwater, and building materials. These soil and rocks can be regarded as the main source. Recently, number of eruption of Mt. Sakurajima is increasing. The aim of our present study is to clarify the relationship between Mt. Sakurajima volcano activity and radon-222 concentration in the environment. The outdoor radon-222 concentration has been measured by pulse-type ionization chamber in Tarumizu City, Kagoshima located at approximately 10 km south-southwest of Mt. Sakurajima. Continuous measurements of radon concentration were performed from Sep., 2008 to Feb., 2010 and from Aug.,2012 to Nov., 2012. Meteorological data such as temperature, humidity, atmospheric pressure, wind speed and precipitation were also observed. A passive integrated radon-thoron discriminative detector is used for measuring indoor and outdoor radon concentrations in dwellings. In the present study, not only these results but also other important parameters such as radon flux density, ambient dose rate and natural radionuclide concentrations, which have a potential relation with outdoor radon concentration around the measured sites are shown.