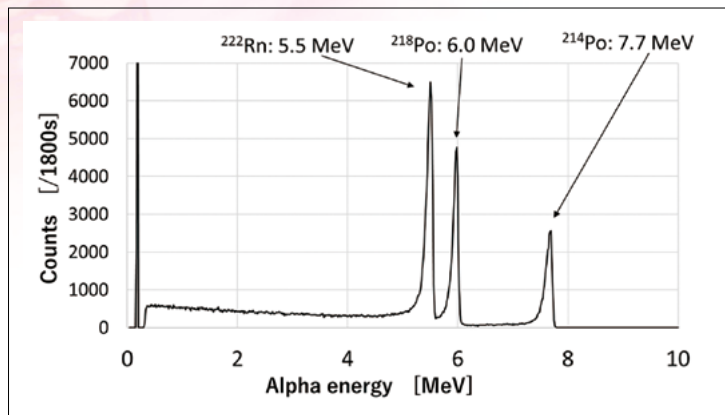


Development of ^{222}Rn primary standard using the proportional counter

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Radon (^{222}Rn) is a naturally occurring radioactive gas and the largest contributor to public exposure to natural radiation. It is established that internal exposure to ^{222}Rn increases the risk of lung cancer, leading to the availability of various radon monitors in the market designed to measure ^{222}Rn activity concentration [Bq m^{-3}]. At NMIJ, the standardization of gaseous ^{222}Rn concentration is currently under development, using a Multi-Electrode Proportional Counter (MEPC) as the primary ^{222}Rn standard. The measurement efficiency of the MEPC is influenced by the geometry of the radiation from ^{222}Rn and its progenies. NMIJ has successfully used the MEPC to determine ^{222}Rn concentrations provisionally. Moving forward, the focus will be on optimizing the measurement conditions of the MEPC to achieve higher accuracy through comparisons with other standards. Additionally, efforts will be made to establish a calibration system for radon monitors.

Reference: R. Furukawa et al., *Appl. Radiat. Isot.* **202**, 111076, 2023,
<https://doi.org/10.1016/j.apradiso.2023.111076>



Typical alpha spectrum obtained by the MEPC



Multi-electrode proportional counter