

Improvement of energy resolution of beta detector in radioxenon detection system (INGAS)

The INGAS detection system for measurement of radioxenon isotopes has been developed. In this system, gamma-rays and beta particles are detected by a well-type NaI(Tl) crystals and plastic scintillator, respectively. The beta detector is a hollow cylindrical plastic scintillator that contains gaseous radioactive source. This geometry can affect the energy resolution of the beta detector. The capability of GATE 7.0 to transport the optical photon was used to study and improve the energy resolution. The effects of main optical parameters such as reflector type and detector dimension on the energy resolution were considered by injection of ^{131}mXe in the beta cell. The results show that the improved energy resolution of beta detector at the energy of 129 keV conversion electron is 37%.

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