

Questions & Answers

(1) Among the following radiation detectors, (a) select all detectors suitable for detection of beta-rays, and (b) select all detectors which can analyze energy of gamma-rays: ionization chamber, Geiger-Müller counter, NaI (Tl), ZnS (Ag), liquid scintillator, Ge detector.

上に英文で挙げた放射線検出器のうち、(a) β 線計測に適したものを全て挙げよ。
(b) また、 γ 線のエネルギー分析ができるものはどれどれか。

A. (a) ionization chamber, Geiger-Müller counter, and liquid scintillator.
(b) NaI (Tl) and Ge detectors

(2) Calculate the effective dose for the case where the equivalent dose for thyroid amounts to 50 mSv due to internal exposure by iodine-131. ヨウ素 131 による内部被曝で、甲状腺の等価線量が 50 mSv だった場合、実効線量はいくらになるか。

A. The tissue weighting factor for thyroid is 0.04 according to the latest ICRP recommendation in 2007. The effective dose is therefore, $50 \text{ mSv} \times 0.04 = \underline{2 \text{ mSv}}$. This means that 50 mSv equivalent dose of radiation only on the thyroid is considered to have the same risk of cancer as in the case of 2 mSv full-body exposure.