

12 (a) Define radioactive *decay constant*.

.....

.....

..... [2]

(b) A sample of radioactive iodine-131 ($^{131}_{53}\text{I}$) of mass $5.87 \times 10^{-10} \text{ kg}$ has an activity of $2.92 \times 10^9 \text{ Bq}$.

Determine the decay constant of iodine-131.

decay constant = s^{-1} [3]

(c) Suggest **two** reasons why a detector placed near to the sample in (b) would record a count rate much less than 2.92×10^9 counts per second.

1.

.....

2.

.....

[2]

[Total: 7]

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