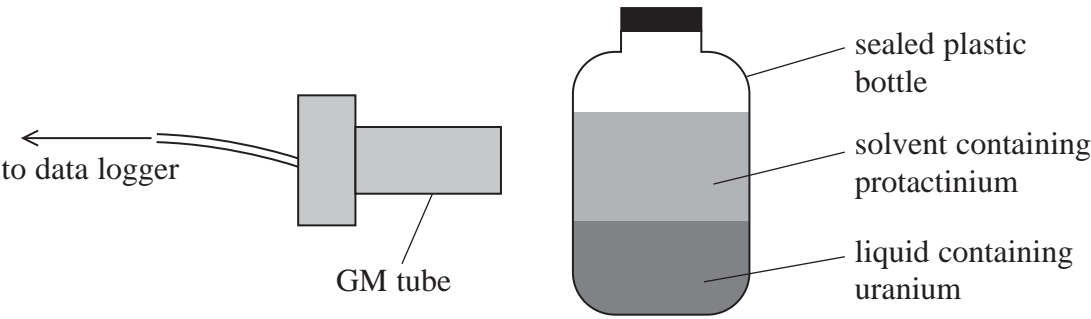


8 A teacher demonstrated the decay of protactinium using a Geiger-Müller (GM) tube connected to a data logger.

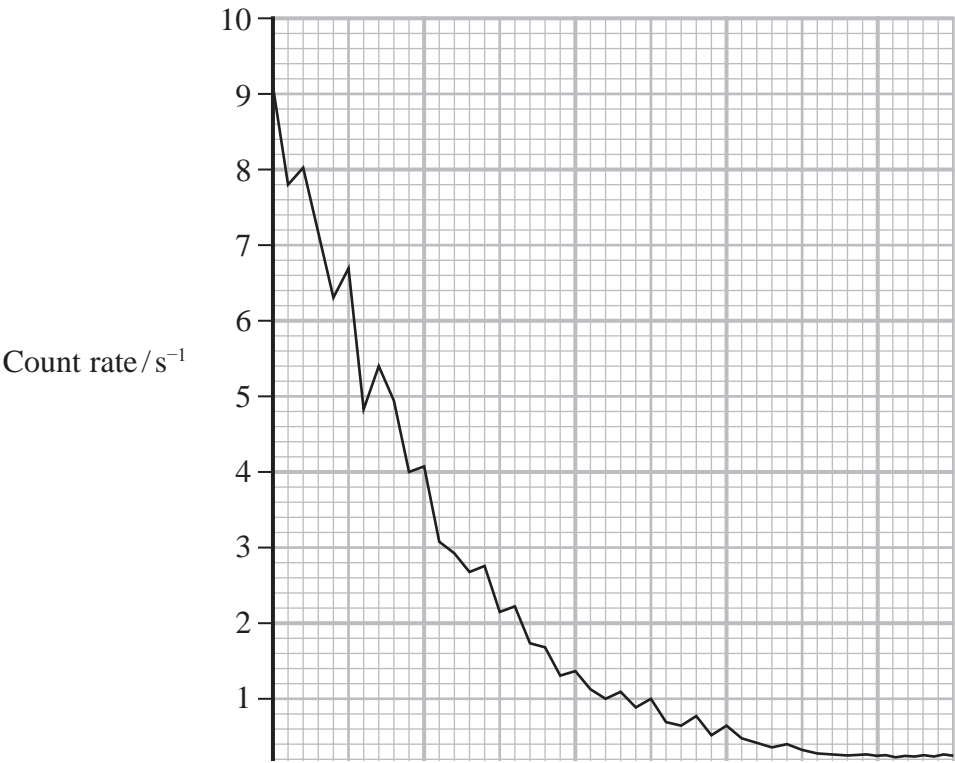
A sealed plastic bottle contains a solvent floating above a liquid containing a uranium salt. Protactinium is produced from the decay of uranium and is present in the solvent as shown.



(a) Deduce whether alpha radiation or beta radiation from the inside of the bottle is detected by the GM tube.

(2)

(b) The data logger output is shown below.



(i) Determine the half-life of the protactinium.

(4)

Half-life of protactinium =

(ii) Explain why the count rate doesn't reach zero.

(2)