

Ch 19

On Dec 3 at 1pm a radioactive substance had 9.8×10^5 disint/min and on Dec 17 at 2:15pm it went down to 2.6×10^4 disint/min. What is the half-life?

Dec 3 @ 1pm to Dec 17 at 2:15pm is 337.25 hrs

$$\ln\left(\frac{N_t}{N_0}\right) = -kt$$

$$\ln\left(\frac{2.6 \times 10^4}{9.8 \times 10^5}\right) = -k(337.25 \text{ hr})$$

$$0.0108 \text{ hr}^{-1} = k$$

$$t_{1/2} = \frac{0.693}{k}$$

$$t_{1/2} = \frac{0.693}{0.0108 \text{ hr}^{-1}}$$

$$= 64.2 \text{ hr}$$

$$= 2.7 \text{ days}$$