Answer on question #51447, Physics, Solid State Physics

Question Define the activity of a given radioactive substance. Calculate the activity of 1g sample of 90Sr whose half life is 28 years. Express your answer in units of Curie (Ci).

Solution Let us find number of decays per second. How many atoms are there in 1 g of ^{90}Sr?

$$N = N_A \frac{1g}{90} \approx 0.67 \cdot 10^{22}$$

How many will decay in 1 s:

$$N \cdot (1 - 2^{-\frac{1}{28 \cdot 31.6 \cdot 10^6}}) \approx 1.467 \cdot 10^{14}$$

If you want to convert it to curie:

$$\frac{1.467 \cdot 10^{14}}{3.7 \cdot 10^10} \approx 0.396 10^4 Ci$$

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