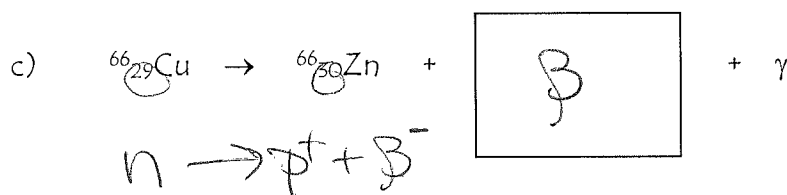
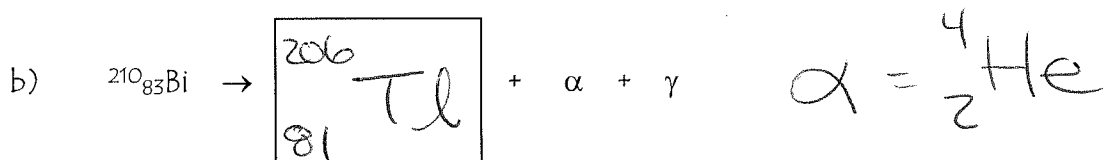
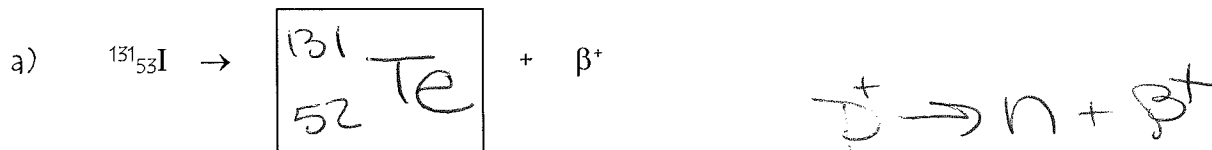


Exercises

1. Balance the following nuclear reactions and identify the type(s) of radioactivity given off.



2. An organism dies, it stops taking in radioactive carbon-14 from the environment. If the carbon-14 to carbon-12 ratio in a piece of petrified wood is one sixteenth the ratio of carbon-14 to carbon-12 in living matter, then how old is the rock? Hint: How many half lives have elapsed? The half-life of carbon-14 is listed in this activity.

$t_{1/2} = 5730 \text{ yr}$ 25730
 $\frac{1}{16} = \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \Rightarrow 4 t_{1/2}$ $\times 4$
 22920 yrs

3. Suppose the 0.75 g of barium-131 were administered to a patient two months (60 days) ago. How many milligrams of barium-131 would still be present in the patient if it only leaves the body via radioactive decay?

$^{131}\text{Ba} \Rightarrow t_{1/2} \approx 12 \text{ days}$ $\frac{60}{12} = 5 t_{1/2}$

$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} = \frac{1}{32} (\text{original amt})$

$\frac{0.75 \text{ g}}{32} = \boxed{0.023 \text{ g } ^{131}\text{Ba}}$

Congratulations! You have completed the final guided inquiry packet of Chem 309.