

Please read Chapter 15 in our text on Nuclear Chemistry and be able to do simple problems like those below.

1. What are the 4 types of radioactive decay? Make a table showing the name, identity, mass and charge of each emitted particle ( $\alpha$ ,  $\beta^-$ ,  $\gamma$ ,  $\beta^+$ , n, p etc).

Name	Symbol	Charge	Mass g/particle
alpha	${}^4_2\text{He}^{+2}$	+2	$6.85 \times 10^{-24}$
Beta			
Position			
Gamma			
Neutron			

Name		Put an example nuclear reaction here.
1	Alpha Decay	${}^{226}_{88}\text{Ra} \longrightarrow {}^{222}_{86}\text{Rn} + \alpha + \text{energy}$
2	Beta Decay	
3	Positron Emission	
4	Electron Capture	
5	Fission	
6	Fusion	

2. The dead sea scrolls were found in 1947. The  ${}^{14}\text{C}$  disintegrations in the linen at this time was about 11 disintegrations per minute per gram ( $\text{d min}^{-1}\text{g}^{-1}$ ). If  $t_{1/2}({}^{14}\text{C}) = 5.73 \times 10^3$  years how old are the scrolls? Living tissue at the time had a level of C-14 of 14.9 disintegrations per min.
3. A sample of radon initially undergoes  $7.0 \times 10^4$  alpha particle disintegration per second (dps). After 6.6 days it undergoes only  $2.1 \times 10^4$  alpha particle dps. What is the  $1/2$ life of this isotope of radon?
4. How does a Geiger Counter work?
5. What is a radioactive decay series? Daughters? Parents? Give an example.