

Name: _____

Nuclear Chemistry Practice

1. What is radiation? _____

2. What is a half life? _____

3. Element A is a radioactive element that decays into element B and has a half life of 20 days. Using this information complete the data tables below:

Mass (g) of Element A	Time (Days)
100g	20
	40
25g	
	80
6.25g	

Mass (g) of Element A	Time (Days)
	20
	40
	60
	80
200g	100

4. Complete the following table:

Type of Radiation	Made of:	Stopped by:	Damages cell? (Y/N)
Alpha			
Beta			
Gamma			

5. What happens to the nucleus of an atom when an alpha particle is released? _____

6. Complete the following table for the changes caused by Alpha Radiation:

	Co	U	Cs	Ra	Mn	Ir	Ta
Initial Atomic Number	27						
New Atomic Number	25						
New Atomic Symbol	Mn						

7. What happens to the nucleus of an atom when a beta particle is released? _____

8. Complete the following table for the changes caused by Beta Radiation:

	Pu	Nd	Pd	Nb	V	Sr	Ti
Initial Atomic Number	94						
New Atomic Number	95						
New Atomic Symbol	Am						

9. The half life of Carbon-14 is 5730 years. Scientists try to determine how old certain things are by determining the number of half lives that the Carbon-14 has gone through. That means that if you had a sample of 100g of Carbon-14 today, 5,730 years from now, there would only be 50g of Carbon-14 left and it would have gone through 1 half life. If another 5,730 years passes there would be 25g of Carbon-14 left and it would have gone through 2 half lives. If an additional 5,730 years passes, there would 12.5g of Carbon-14 left and it would have gone through 3 half lives.

Use this information to answer the following questions:

A. How many half lives does Carbon-14 go through in 11,460 years?

B. How many half lives does Carbon-14 go through in 34,380 years?

C. How old is an object whose Carbon-14 went through 3 half lives?

D. How old is an object whose Carbon-14 went through 10 half-lives?

E. Scientists do not use Carbon-14 to date anything older than 60,000 years. How many half lives does Carbon-14 go through in 60,000 years?

F. Why do you think scientists do not use Carbon-14 for objects older than 60,000 years?