

## Chapter 4 & 25 Test Review

Name \_\_\_\_\_

Period \_\_\_\_\_

### Define the following terms:

1. Atomic number –
2. Atomic mass (mass number) –
3. Isotopes –
4. A.m.u –
5. Alpha radiation –
6. Beta radiation –
7. Gamma radiation –
8. Radioactivity –
9. Ionizing radiation –
10. Radioisotope –
11. Transmutation –
12. Induced transmutation –
13. Radiochemical dating –
14. Belt of stability –
15. Neutron-to-proton ratio –
16. Nucleon –
17. Positron emission –
18. Electron capture –
19. The strong nuclear force –
20. Half-life –
21. Critical mass –
22. X rays –
23. Breeder reactor –
24. All nuclear fission reactions produce \_\_\_\_\_

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25. What are the problems with nuclear power plants?

26. What do fusion reactions require?

**What did each of the following scientists discover? Include theories, models, and experiments**

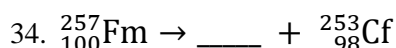
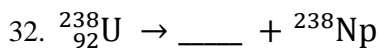
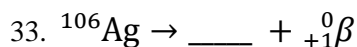
27. Thomson –

28. Rutherford –

29. Bohr –

30. Dalton –

**Reaction Practice – complete the following radioactive decays and identify which type of decay it is**



**Half-Life Practice – show work or no credit will be given:**

35. The half-life of neptunium-237 is 4.6 days. How much of a 100 g sample is left after 18.4 days?

36. How much of a 125 g sample of scandium-40 is left after 35 hours if its half-life is 7 hours?

37. If you have 25 mg of zirconium-85 left over after 32 days, how much did you start with if the half-life of Zirconium-85 is 8 days?

**Complete the following table:**

Isotope	Symbolic Notation	Number of Protons	Number of Electrons	Number of Neutrons
Zinc-62	${}^{62}_{30}\text{Zn}^{2+}$	30	28	32
Silver-108			46	
	${}^{32}_{16}\text{S}^{2-}$			
Bismuth-210			83	

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Define the following terms:

**KEY**

1. Atomic number –
2. Atomic mass (mass number) –
3. Isotopes –
4. A.m.u – **1/12 of a Carbon-12 atom; the units of measurement for subatomic particles**
5. Alpha radiation –
6. Beta radiation –
7. Gamma radiation –
8. Radioactivity –
9. Ionizing radiation –
10. Radioisotope –
11. Transmutation –
12. Induced transmutation –
13. Radiochemical dating –
14. Belt of stability –
15. Neutron-to-proton ratio –
16. Nucleon –
17. Positron emission –
18. Electron capture –
19. The strong nuclear force –
20. Half-life –
21. Critical mass –
22. X rays –
23. Breeder reactor –
24. All nuclear fission reactions produce **energy**

25. What are the problems with nuclear power plants?

26. What do fusion reactions require? **High temperatures**

What did each of the following scientists discover? Include theories, models, and experiments

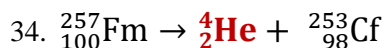
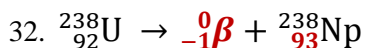
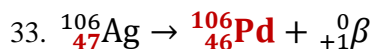
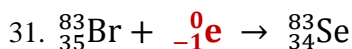
27. Thomson – **electron, charge of electron, cathode ray tube, plum pudding model**

28. Rutherford – **dense nucleus, mostly empty space, charge of nucleus, gold foil**

29. Bohr – **electron energy levels, planetary model**

30. Dalton – **atomic theory**

Reaction Practice – complete the following radioactive decays and identify which type of decay it is



Half-Life Practice – show work or no credit will be given:

35. The half-life of neptunium-237 is 4.6 days. How much of a 100 g sample is left after 18.4 days?

**4 half-lives    6.25 g**

36. How much of a 125 g sample of scandium-40 is left after 35 hours if its half-life is 7 hours?

**5 half-lives    3.91 g**

37. If you have 25 mg of zirconium-85 left over after 32 days, how much did you start with if the half-life of Zirconium-85 is 8 days?

**4 half-lives passed    400 mg**

Complete the following table:

Isotope	Symbolic Notation	Number of Protons	Number of Electrons	Number of Neutrons
Zinc-62	${}_{30}^{62}\text{Zn}^{2+}$	30	28	32
Silver-108	${}_{47}^{108}\text{Ag}^{1+}$	<b>47</b>	46	<b>61</b>
Sulfur-32	${}_{16}^{32}\text{S}^{2-}$	<b>16</b>	<b>18</b>	<b>16</b>
Bismuth-210	${}_{83}^{210}\text{Bi}$	<b>83</b>	83	<b>127</b>