Nuclear Chemistry Worksheet
AP Physics 2

Name _____

Fill in the blanks with the appropriate atomic symbols. Make sure you use the law of conservation of mass to solve these problems.

1. $^{37}_{18}Ar + {}^{0}_{-1}e \rightarrow$ _____

2. $^{214}_{83}Bi \rightarrow {}^{214}_{84}Po +$ _____

3. $^{251}_{98}Cf \rightarrow {}^{247}_{96}Cm +$ _____

4. $^{234}_{91}Pa \rightarrow$ _____ $+ {}^{0}_{-1}e$

5. $^{227}_{89}Ac \rightarrow$ _____ $+ {}^{0}_{-1}e$

6. $^{234}_{91}Pa \rightarrow$ _____ $+ {}^{4}_{2}He$

7. $^{42}_{19}K \rightarrow {}^{0}_{-1}e +$ _____

8. $^{9}_{4}Be + {}^{4}_{2}He \rightarrow$ _____

9. $^{22}_{11}Na +$ _____ $\rightarrow {}^{22}_{10}Ne$

10. _____ $\rightarrow {}^{4}_{2}He + {}^{208}_{81}Tl$

11. $^{99}_{43}Tc \rightarrow$ _____ $+ {}^{0}_{-1}e$

12. $^{239}_{94}Pu \rightarrow$ _____ $+ {}^{4}_{2}He$

13. For #1-12 go back and label each reaction as involving an alpha, beta, or gamma particle. Label also whether it is an example of decay (that particle being given off) or capture (that particle being taken in).

14. Write the equation for the alpha decay of curium-247

15. Write the equation for the beta capture of manganese-53

16. Write the equation for the beta decay of sulfur-35

17. Write the equation for the beta capture of tellurium-121

18. Write the equation for when gamma radiation is given off by carbon-13.

Identify whether each of the following will undergo alpha decay, beta decay, or beta capture

19. einsteinium-252 _____

20. strontium-85 _____

21. americium-243 _____

21. krypton-79 _____

22. Palladium-109 _____

23. zinc-62 _____

24. What is happening when gamma radiation is given off?

Complete the missing information in the reactions. Then, label the reaction one of the following:
Alpha Decay ***Beta Decay*** ***Electron Capture*** ***Positron Emission***

25. $\square \rightarrow {}^{14}_{7}\mathrm{N} + {}^{0}_{-1}\mathrm{e}$ Type: _____

26. ${}^{238}_{92}\mathrm{U} \rightarrow {}^{234}_{90}\mathrm{Th} + \square$ Type: _____

27. ${}^{15}_{8}\mathrm{O} \rightarrow {}^{15}_{7}\mathrm{N} + \square$ Type: _____

28. ${}^{32}_{15}\mathrm{P} \rightarrow \square + {}^{0}_{-1}\mathrm{e}$ Type: _____

29. ${}^{105}_{47}\mathrm{Ag} + \square \rightarrow {}^{105}_{46}\mathrm{Pd}$ Type: _____

30. $\square \rightarrow {}^{0}_{+1}\mathrm{e} + {}^{40}_{20}\mathrm{Ca}$ Type: _____

31. ${}^{244}_{94}\mathrm{Pu} \rightarrow {}^{4}_{2}\mathrm{He} + \square$ Type: _____