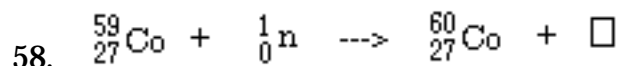
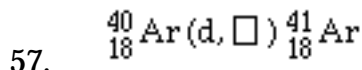
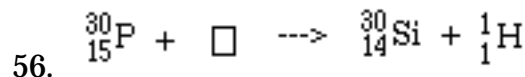
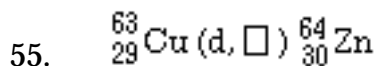
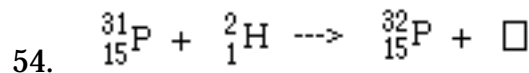
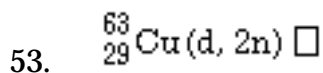
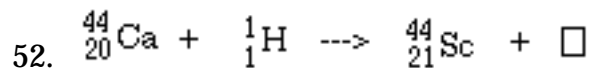
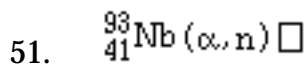
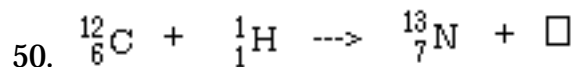
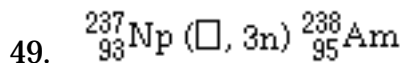
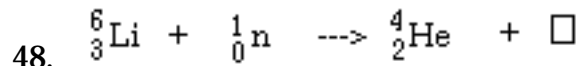
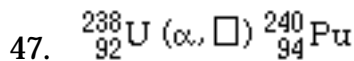
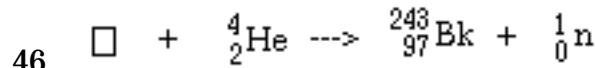
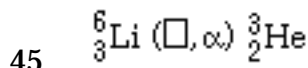
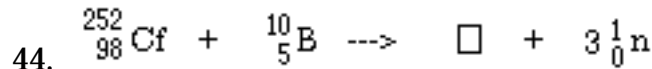
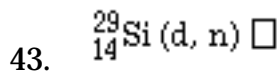
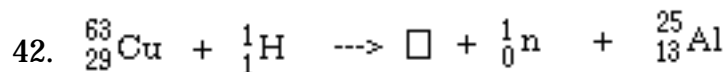
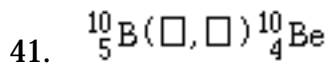
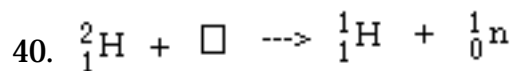
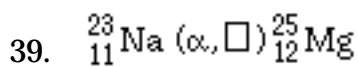


Nuclear Reactions Worksheet

Fill in the box and write the equation in the opposite form (either long or short).

1. ${}_{17}^{33}\text{Cl} (n, \square) {}_{15}^{31}\text{P}$
2. ${}_{17}^{37}\text{Cl} + {}_1^1\text{H} \rightarrow \square$ (no short form please)
3. ${}_{11}^{23}\text{Na} (\alpha, \square) {}_{11}^{23}\text{Na}$
4. ${}_{8}^{16}\text{O} + {}_1^1\text{H} \rightarrow {}_{7}^{13}\text{N} + \square$
5. ${}_{11}^{23}\text{Na} (\alpha, \square) {}_{12}^{26}\text{Mg}$
6. ${}_{99}^{253}\text{Es} + \square \rightarrow {}_{101}^{256}\text{Md} + {}_0^1\text{n}$
7. ${}_{11}^{23}\text{Na} (n, \beta^-) \square$
8. ${}_{15}^{31}\text{P} + \square \rightarrow {}_{14}^{28}\text{Si} + {}_2^4\text{He}$
9. ${}_{4}^9\text{Be} (\square, n) {}_{6}^{12}\text{C}$
10. ${}_{42}^{98}\text{Mo} + {}_1^2\text{H} \rightarrow \square + {}_0^1\text{n}$
11. ${}_{3}^7\text{Li} (p, \alpha) \square$
12. ${}_{5}^{11}\text{B} + {}_2^4\text{He} \rightarrow {}_0^1\text{n} + \square$
13. ${}_{48}^{113}\text{Cd} (\square, \gamma) {}_{48}^{113}\text{Cd}$
14. ${}_{92}^{238}\text{U} + {}_{6}^{12}\text{C} \rightarrow 4 {}_0^1\text{n} + \square$
15. ${}_{3}^6\text{Li} (n, \alpha) \square$
16. ${}_{92}^{238}\text{U} + {}_{6}^{12}\text{C} \rightarrow \square + 6 {}_0^1\text{n}$
17. ${}_{1}^2\text{H} (\gamma, p) \square$
18. ${}_{5}^{10}\text{B} + \alpha \rightarrow \square + {}_{7}^{13}\text{N}$
19. $\square (d, p) {}_{15}^{32}\text{P}$
20. ${}_{4}^9\text{Be} + {}_1^1\text{H} \rightarrow {}_{3}^6\text{Li} + \square$
21. ${}_{92}^{238}\text{U} (\square, \square) {}_{93}^{239}\text{Np}$
22. ${}_{17}^{35}\text{Cl} + {}_0^1\text{n} \rightarrow {}_{16}^{35}\text{S} + \square$
23. ${}_{17}^{37}\text{Cl} (\square, \alpha) {}_{16}^{35}\text{S}$
24. ${}_{94}^{239}\text{Pu} + {}_2^4\text{He} \rightarrow \square + {}_0^1\text{n}$
25. ${}_{13}^{27}\text{Al} (\alpha, n) \square$
26. ${}_{30}^{64}\text{Zn} + \square \rightarrow {}_{29}^{63}\text{Cu} + {}_0^1\text{n}$
27. ${}_{98}^{249}\text{Cf} (\square, 4n) {}_{106}^{263}\text{Unh}$
28. ${}_{83}^{209}\text{Bi} + \alpha \rightarrow {}_{85}^{211}\text{At} + \square$
29. $\square ({}_{5}^{11}\text{B}, 4n) {}_{103}^{257}\text{Lr}$
30. $\square + {}_1^2\text{H} \rightarrow {}_{28}^{61}\text{Ni} + {}_2^4\text{He}$
31. ${}_{7}^{14}\text{N} (\square, p) {}_{8}^{17}\text{O}$
32. ${}_{7}^{14}\text{N} + {}_0^1\text{n} \rightarrow {}_{6}^{14}\text{C} + \square$
33. ${}_{11}^{23}\text{Na} (\alpha, \square) {}_{13}^{27}\text{Al}$
34. ${}_{24}^{54}\text{Cr} + {}_1^1\text{H} \rightarrow {}_{25}^{54}\text{Mn} + \square$
35. ${}_{11}^{23}\text{Na} (\alpha, \square) {}_{13}^{26}\text{Al}$
36. ${}_{52}^{125}\text{Te} + {}_1^1\text{H} \rightarrow {}_0^1\text{n} + \square$
37. ${}_{46}^{106}\text{Pd} (n, p) \square$
38. ${}_{1}^2\text{H} + {}_{1}^2\text{H} \rightarrow {}_{1}^1\text{H} + \square$



Below are several fission reactions. Please fill in the missing portions.

