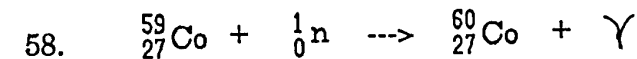
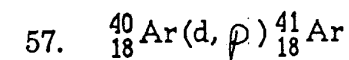
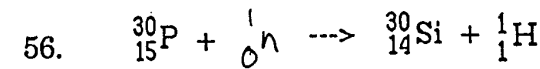
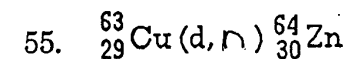
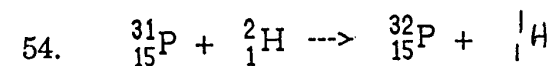
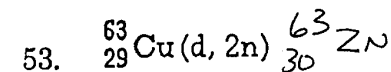
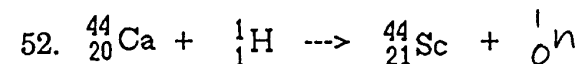
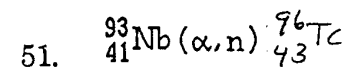
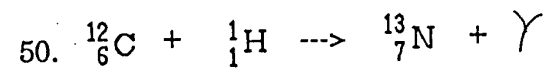
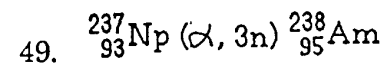
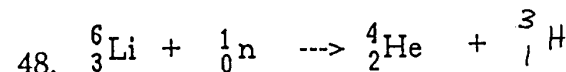
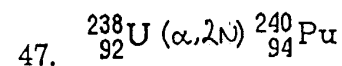
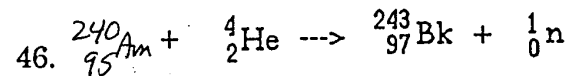
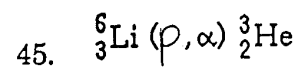
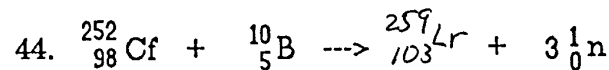
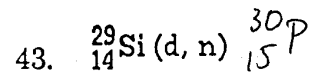
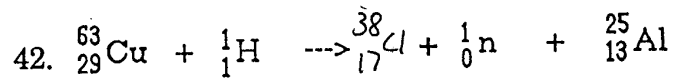
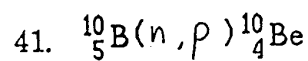
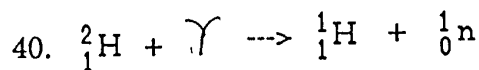
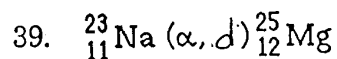
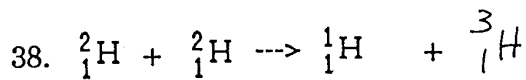
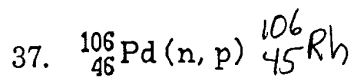


Nuclear Reactions Worksheet

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

- | | |
|---|---|
| 1. ${}_{17}^{33}\text{Cl} (n, {}_2^3\text{He}) {}_{15}^{31}\text{P}$ | 2. ${}_{17}^{37}\text{Cl} + {}_1^1\text{H} \rightarrow {}_{18}^{38}\text{Ar}$ (no short form please) |
| 3. ${}_{11}^{23}\text{Na} (\alpha, \alpha) {}_{11}^{23}\text{Na}$ | 4. ${}_{8}^{16}\text{O} + {}_1^1\text{H} \rightarrow {}_7^{13}\text{N} + {}_2^4\text{He}$ |
| 5. ${}_{11}^{23}\text{Na} (\alpha, p) {}_{12}^{26}\text{Mg}$ | 6. ${}_{99}^{253}\text{Es} + {}_2^4\text{He} \rightarrow {}_{101}^{256}\text{Md} + {}_0^1\text{n}$ |
| 7. ${}_{11}^{23}\text{Na} (n, \beta^-) {}_{12}^{24}\text{Mg}$ | 8. ${}_{15}^{31}\text{P} + {}_1^1\text{H} \rightarrow {}_{14}^{28}\text{Si} + {}_2^4\text{He}$ |
| 9. ${}_{4}^9\text{Be} (\alpha, n) {}_{6}^{12}\text{C}$ | 10. ${}_{42}^{98}\text{Mo} + {}_1^2\text{H} \rightarrow {}_{43}^{99}\text{Tc} + {}_0^1\text{n}$ |
| 11. ${}_{3}^7\text{Li} (p, \alpha) {}_2^4\text{He}$ | 12. ${}_{5}^{11}\text{B} + {}_2^4\text{He} \rightarrow {}_0^1\text{n} + {}_7^{14}\text{N}$ |
| 13. ${}_{48}^{113}\text{Cd} (\gamma, \gamma) {}_{48}^{113}\text{Cd}$ | 14. ${}_{92}^{238}\text{U} + {}_6^{12}\text{C} \rightarrow 4 {}_0^1\text{n} + {}_{98}^{246}\text{Cf}$ |
| 15. ${}_{3}^6\text{Li} (n, \alpha) {}_2^3\text{He}$ | 16. ${}_{92}^{238}\text{U} + {}_6^{12}\text{C} \rightarrow {}_{98}^{244}\text{Cf} + 6 {}_0^1\text{n}$ |
| 17. ${}_{1}^2\text{H} (\gamma, p) {}_0^1\text{n}$ | 18. ${}_{5}^{10}\text{B} + \alpha \rightarrow {}_0^1\text{n} + {}_{7}^{13}\text{N}$ |
| 19. ${}_{15}^{31}\text{P} (d, p) {}_{15}^{32}\text{P}$ | 20. ${}_{4}^9\text{Be} + {}_1^1\text{H} \rightarrow {}_{3}^6\text{Li} + {}_2^4\text{He}$ |
| 21. ${}_{92}^{238}\text{U} (n, \beta) {}_{93}^{239}\text{Np}$ (p, γ)
<small style="margin-left: 100px;">or</small> | 22. ${}_{17}^{35}\text{Cl} + {}_0^1\text{n} \rightarrow {}_{16}^{35}\text{S} + {}_1^1\text{H}$ |
| 23. ${}_{17}^{37}\text{Cl} (d, \alpha) {}_{16}^{35}\text{S}$ | 24. ${}_{94}^{239}\text{Pu} + {}_2^4\text{He} \rightarrow {}_{96}^{242}\text{Cm} + {}_0^1\text{n}$ |
| 25. ${}_{13}^{27}\text{Al} (\alpha, n) {}_{15}^{30}\text{P}$ | 26. ${}_{30}^{64}\text{Zn} + {}_{-1}^0\text{e} \rightarrow {}_{29}^{63}\text{Cu} + {}_0^1\text{n}$ |
| 27. ${}_{98}^{249}\text{Cf} ({}_{8}^{18}\text{O}, 4n) {}_{106}^{263}\text{Unh}$ | 28. ${}_{83}^{209}\text{Bi} + \alpha \rightarrow {}_{85}^{211}\text{At} + 2 {}_0^1\text{n}$ |
| 29. ${}_{98}^{250}\text{Cf} ({}_{5}^{11}\text{B}, 4n) {}_{103}^{257}\text{Lr}$ | 30. ${}_{29}^{63}\text{Cu} + {}_1^2\text{H} \rightarrow {}_{28}^{61}\text{Ni} + {}_2^4\text{He}$ |
| 31. ${}_{7}^{14}\text{N} (\alpha, p) {}_{8}^{17}\text{O}$ | 32. ${}_{7}^{14}\text{N} + {}_0^1\text{n} \rightarrow {}_{6}^{14}\text{C} + {}_1^1\text{H}$ |
| 33. ${}_{11}^{23}\text{Na} (\alpha, \gamma) {}_{13}^{27}\text{Al}$ | 34. ${}_{24}^{54}\text{Cr} + {}_1^1\text{H} \rightarrow {}_{25}^{54}\text{Mn} + {}_0^1\text{n}$ |
| 35. ${}_{11}^{23}\text{Na} (\alpha, n) {}_{13}^{26}\text{Al}$ | 36. ${}_{52}^{125}\text{Te} + {}_1^1\text{H} \rightarrow {}_0^1\text{n} + {}_{53}^{125}\text{I}$ |



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

