

3-3 Practice Problems, pages 19-20

Answers marked with an asterisk denote additional practice problems that appear in the Teacher's Edition.

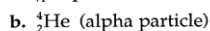
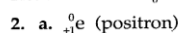
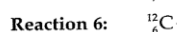
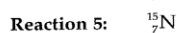
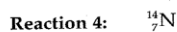
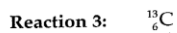
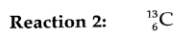
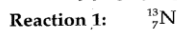
- *1. 23 protons and 23 electrons
- *2. 7 protons and 7 electrons
3. 18 protons and 18 electrons
4. 19 protons and 19 electrons
5. 78 protons and 78 electrons
6. boron
7. chlorine
8. manganese
9. lead
10. uranium
- *11. Mg^{2+}
- *12. W^{6+}
13. Am^{6+}
14. As^{3-}
15. Cu^{2+}
- *16. 28 protons, 31 neutrons, and 26 electrons
- *17. 40 protons, 51 neutrons, and 36 electrons
18. 58 protons, 82 neutrons, and 55 electrons
19. 34 protons, 45 neutrons, and 36 electrons
20. 21 protons, 24 neutrons, and 18 electrons
21. 6 protons, 7 neutrons, and 10 electrons
22. ${}_{84}^{209}\text{Po}^{4+}$
23. ${}_{27}^{59}\text{Co}^{2+}$
24. ${}_{73}^{181}\text{Ta}^{5+}$
25. ${}_{31}^{70}\text{Ga}^{3+}$

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- *1. ${}_{91}^{231}\text{Pa} \rightarrow {}_{89}^{227}\text{Ac} + {}_2^4\alpha$
- *2. ${}_{87}^{223}\text{Fr} \rightarrow {}_{88}^{223}\text{Ra} + {}_{-1}^0\beta$
3. ${}_{62}^{149}\text{Sm} \rightarrow {}_{60}^{145}\text{Nd} + {}_2^4\alpha$
4. ${}_{61}^{165}\text{Pm} \rightarrow {}_{62}^{165}\text{Sm} + {}_{-1}^0\beta$
5. ${}_{101}^{249}\text{Md} \rightarrow {}_{99}^{245}\text{Es} + {}_2^4\alpha$
6. ${}_{62}^{146}\text{Sm} \rightarrow {}_{60}^{142}\text{Nd} + {}_2^4\alpha$
7. ${}_{85}^{198}\text{At} \rightarrow {}_{86}^{198}\text{Rn} + {}_{-1}^0\beta$
8. ${}_{64}^{150}\text{Gd} \rightarrow {}_{62}^{146}\text{Sm} + {}_2^4\alpha$
9. ${}_{54}^{152}\text{Xe} \rightarrow {}_{55}^{152}\text{Cs} + {}_{-1}^0\beta$
10. ${}_{55}^{120}\text{Cs} \rightarrow {}_{56}^{120}\text{Ba} + {}_{-1}^0\beta$

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3. The nitrogen nuclei enter the next reaction and undergo radioactive decay.
4. Carbon-12 produced by the sixth reaction becomes a reactant in the first reaction.
5. The product of each reaction becomes the reactant in the next reaction. The carbon-12 produced in the sixth reaction becomes the reactant in the first step, thus beginning the cycle again.