

Chemical Reactions and Equations

Balance The Chemical Equations

1. $\text{Fe(s)} + \text{H}_2\text{SO}_4(\text{aq}) \rightarrow \text{Fe}_2(\text{SO}_4)_3(\text{aq}) + \text{H}_2(\text{g})$
2. $\text{NaC}_2\text{H}_3\text{O}_2(\text{aq}) + \text{H}_2\text{CO}_3(\text{aq}) \rightarrow \text{Na}_2\text{CO}_3(\text{aq}) + \text{HC}_2\text{H}_3\text{O}_2(\text{aq})$
3. $(\text{NH}_4)_3\text{PO}_4(\text{aq}) + \text{Pb}(\text{NO}_3)_4(\text{aq}) \rightarrow \text{Pb}_3(\text{PO}_4)_4(\text{s}) + \text{NH}_4\text{NO}_3(\text{aq})$
4. $\text{C}_4\text{H}_{10}(\text{g}) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{g})$
5. $\text{H}_3\text{PO}_4(\text{aq}) + \text{HCl}(\text{aq}) \rightarrow \text{PCl}_5(\text{s}) + \text{H}_2\text{O}(\text{l})$
6. $\text{Hg}(\text{OH})_2(\text{s}) + \text{H}_3\text{AsO}_4(\text{aq}) \rightarrow \text{Hg}_3(\text{AsO}_4)_2(\text{s}) + \text{H}_2\text{O}(\text{l})$
7. $\text{HClO}_4(\text{aq}) + \text{P}_4\text{O}_{10}(\text{s}) \rightarrow \text{H}_3\text{PO}_4(\text{aq}) + \text{Cl}_2\text{O}_7(\text{l})$
8. $\text{C}_8\text{H}_{10}(\text{l}) + \text{O}_2(\text{g}) \rightarrow \text{CO}_2(\text{g}) + \text{H}_2\text{O}(\text{g})$
9. $\text{Li}_3\text{PO}_4 + \text{NaOH} \rightarrow \text{LiOH} + \text{Na}_3\text{PO}_4$
10. $\text{MgF}_2 + \text{Li}_2\text{CO}_3 \rightarrow \text{MgCO}_3 + \text{LiF}$
11. $\text{P}_4 + \text{O}_2 \rightarrow \text{P}_2\text{O}_3$
12. $\text{RbNO}_3 + \text{MgF}_2 \rightarrow \text{Mg}(\text{NO}_3)_2 + \text{RbF}$
13. $\text{AgNO}_3 + \text{Cu} \rightarrow \text{Cu}(\text{NO}_3)_2 + \text{Ag}$
14. $\text{CF}_4 + \text{Br}_2 \rightarrow \text{CBr}_4 + \text{F}_2$
15. $\text{HCN} + \text{CuSO}_4 \rightarrow \text{H}_2\text{SO}_4 + \text{Cu}(\text{CN})_2$
16. $\text{GaF}_3 + \text{Cs} \rightarrow \text{CsF} + \text{Ga}$
17. $\text{SrS} + \text{PtF}_2 \rightarrow \text{SrF}_2 + \text{PtS}$
18. $\text{N}_2 + \text{H}_2 \rightarrow \text{NH}_3$
19. $\text{LiF} + \text{Br}_2 \rightarrow \text{LiBr} + \text{F}_2$
20. $\text{Pb}(\text{OH})_2 + \text{HCl} \rightarrow \text{H}_2\text{O} + \text{PbCl}_2$
21. $\text{GaBr}_3 + \text{Na}_2\text{CO}_3 \rightarrow \text{NaBr} + \text{Ga}_2(\text{CO}_3)_3$
22. $\text{CH}_4 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$
23. $\text{Li}_3\text{PO}_4 + \text{CaCl}_2 \rightarrow \text{LiCl} + \text{Ca}_3(\text{PO}_4)_2$
24. $\text{Na} + \text{Cl}_2 \rightarrow \text{NaCl}$
25. $\text{Ga} + \text{HCl} \rightarrow \text{H}_2 + \text{GaCl}_3$
26. $\text{N}_2 + \text{F}_2 \rightarrow \text{NF}_3$
27. $\text{SO}_2 + \text{Li}_2\text{Se} \rightarrow \text{SSe}_2 + \text{Li}_2\text{O}$
28. $\text{NH}_3 + \text{H}_2\text{SO}_4 \rightarrow (\text{NH}_4)_2\text{SO}_4$
29. $\text{AlBr}_3 + \text{K} \rightarrow \text{KBr} + \text{Al}$
30. $\text{FeO} + \text{PdF}_2 \rightarrow \text{FeF}_2 + \text{PdO}$
31. $\text{P}_4 + \text{Br}_2 \rightarrow \text{PBr}_3$
32. $\text{LiCl} + \text{Br}_2 \rightarrow \text{LiBr} + \text{Cl}_2$
33. $\text{PbBr}_2 + \text{HCl} \rightarrow \text{HBr} + \text{PbCl}_2$
34. $\text{CoBr}_3 + \text{CaSO}_4 \rightarrow \text{CaBr}_2 + \text{Co}_2(\text{SO}_4)_3$
35. $\text{Na}_3\text{P} + \text{CaF}_2 \rightarrow \text{NaF} + \text{Ca}_3\text{P}_2$
36. $\text{Mn} + \text{HI} \rightarrow \text{H}_2 + \text{MnI}_3$
37. $\text{Li}_3\text{PO}_4 + \text{NaBr} \rightarrow \text{Na}_3\text{PO}_4 + \text{LiBr}$
38. $\text{CaF}_2 + \text{Li}_2\text{SO}_4 \rightarrow \text{CaSO}_4 + \text{LiF}$
39. $\text{HBr} + \text{Mg}(\text{OH})_2 \rightarrow \text{MgBr}_2 + \text{H}_2\text{O}$
40. $\text{LiNO}_3 + \text{CaBr}_2 \rightarrow \text{Ca}(\text{NO}_3)_2 + \text{LiBr}$
41. $\text{AgNO}_3 + \text{Li} \rightarrow \text{LiNO}_3 + \text{Ag}$
42. $\text{Si}(\text{OH})_4 + \text{NaBr} \rightarrow \text{SiBr}_4 + \text{NaOH}$
43. $\text{NaCN} + \text{CuCO}_3 \rightarrow \text{Na}_2\text{CO}_3 + \text{Cu}(\text{CN})_2$

Challenge: $\text{C}_2\text{H}_6 + \text{O}_2 \rightarrow \text{CO}_2 + \text{H}_2\text{O}$

Answers

- 1) $2 \text{Fe(s)} + 3 \text{H}_2\text{SO}_4\text{(aq)} \rightarrow 1 \text{Fe}_2(\text{SO}_4)_3\text{(aq)} + 3 \text{H}_2\text{(g)}$
 - 2) $2 \text{NaC}_2\text{H}_3\text{O}_2\text{(aq)} + 1 \text{H}_2\text{CO}_3\text{(aq)} \rightarrow 1 \text{Na}_2\text{CO}_3\text{(aq)} + 2 \text{HC}_2\text{H}_3\text{O}_2\text{(aq)}$
 - 3) $4 (\text{NH}_4)_3\text{PO}_4\text{(aq)} + 3 \text{Pb}(\text{NO}_3)_4\text{(aq)} \rightarrow 1 \text{Pb}_3(\text{PO}_4)_4\text{(s)} + 12 \text{NH}_4\text{NO}_3\text{(aq)}$
 - 4) $2 \text{C}_4\text{H}_{10}\text{(g)} + 13 \text{O}_2\text{(g)} \rightarrow 8 \text{CO}_2\text{(g)} + 10 \text{H}_2\text{O(g)}$
 - 5) $1 \text{H}_3\text{PO}_4\text{(aq)} + 5 \text{HCl(aq)} \rightarrow 1 \text{PCl}_5\text{(s)} + 4 \text{H}_2\text{O(l)}$
 - 6) $3 \text{Hg(OH)}_2\text{(s)} + 2 \text{H}_3\text{AsO}_4\text{(aq)} \rightarrow 1 \text{Hg}_3(\text{AsO}_4)_2\text{(s)} + 6 \text{H}_2\text{O(l)}$
 - 7) $12 \text{HClO}_4\text{(aq)} + 1 \text{P}_4\text{O}_{10}\text{(s)} \rightarrow 4 \text{H}_3\text{PO}_4\text{(aq)} + 6 \text{Cl}_2\text{O}_7\text{(l)}$
 - 8) $2 \text{C}_8\text{H}_{10}\text{(l)} + 21 \text{O}_2\text{(g)} \rightarrow 16 \text{CO}_2\text{(g)} + 10 \text{H}_2\text{O(g)}$
 - 9) $1 \text{Li}_3\text{PO}_4 + 3 \text{NaOH} \rightarrow 3 \text{LiOH} + 1 \text{Na}_3\text{PO}_4$
 - 10) $1 \text{MgF}_2 + 1 \text{Li}_2\text{CO}_3 \rightarrow 1 \text{MgCO}_3 + 2 \text{LiF}$
 - 11) $1 \text{P}_4 + 3 \text{O}_2 \rightarrow 2 \text{P}_2\text{O}_3$
 - 12) $2 \text{RbNO}_3 + 1 \text{MgF}_2 \rightarrow 1 \text{Mg}(\text{NO}_3)_2 + 2 \text{RbF}$
 - 13) $2 \text{AgNO}_3 + 1 \text{Cu} \rightarrow 1 \text{Cu}(\text{NO}_3)_2 + 2 \text{Ag}$
 - 14) $1 \text{CF}_4 + 2 \text{Br}_2 \rightarrow 1 \text{CBr}_4 + 2 \text{F}_2$
 - 15) $2 \text{HCN} + 1 \text{CuSO}_4 \rightarrow 1 \text{H}_2\text{SO}_4 + 1 \text{Cu}(\text{CN})_2$
 - 16) $1 \text{GaF}_3 + 3 \text{Cs} \rightarrow 3 \text{CsF} + 1 \text{Ga}$
 - 17) $1 \text{SrS} + 1 \text{PtF}_2 \rightarrow 1 \text{SrF}_2 + 1 \text{PtS}$
 - 18) $1 \text{N}_2 + 3 \text{H}_2 \rightarrow 2 \text{NH}_3$
 - 19) $2 \text{LiF} + 1 \text{Br}_2 \rightarrow 2 \text{LiBr} + 1 \text{F}_2$
 - 20) $1 \text{Pb(OH)}_2 + 2 \text{HCl} \rightarrow 2 \text{H}_2\text{O} + 1 \text{PbCl}_2$
 - 21) $2 \text{GaBr}_3 + 3 \text{Na}_2\text{CO}_3 \rightarrow 6 \text{NaBr} + 1 \text{Ga}_2(\text{CO}_3)_3$
 - 22) $1 \text{CH}_4 + 2 \text{O}_2 \rightarrow 1 \text{CO}_2 + 2 \text{H}_2\text{O}$
 - 23) $2 \text{Li}_3\text{PO}_4 + 3 \text{CaCl}_2 \rightarrow 6 \text{LiCl} + 1 \text{Ca}_3(\text{PO}_4)_2$
 - 24) $2 \text{Na} + 1 \text{Cl}_2 \rightarrow 2 \text{NaCl}$
 - 25) $2 \text{Ga} + 6 \text{HCl} \rightarrow 3 \text{H}_2 + 2 \text{GaCl}_3$
 - 26) $1 \text{N}_2 + 3 \text{F}_2 \rightarrow 2 \text{NF}_3$
 - 27) $1 \text{SO}_2 + 2 \text{Li}_2\text{Se} \rightarrow 1 \text{SSe}_2 + 2 \text{Li}_2\text{O}$
 - 28) $2 \text{NH}_3 + 1 \text{H}_2\text{SO}_4 \rightarrow 1 (\text{NH}_4)_2\text{SO}_4$
 - 29) $1 \text{AlBr}_3 + 3 \text{K} \rightarrow 3 \text{KBr} + 1 \text{Al}$
 - 30) $1 \text{FeO} + 1 \text{PdF}_2 \rightarrow 1 \text{FeF}_2 + 1 \text{PdO}$
 - 31) $1 \text{P}_4 + 6 \text{Br}_2 \rightarrow 4 \text{PBr}_3$
 - 32) $2 \text{LiCl} + 1 \text{Br}_2 \rightarrow 2 \text{LiBr} + 1 \text{Cl}_2$
 - 33) $1 \text{PbBr}_2 + 2 \text{HCl} \rightarrow 2 \text{HBr} + 1 \text{PbCl}_2$
 - 34) $2 \text{CoBr}_3 + 3 \text{CaSO}_4 \rightarrow 3 \text{CaBr}_2 + 1 \text{Co}_2(\text{SO}_4)_3$
 - 35) $2 \text{Na}_3\text{P} + 3 \text{CaF}_2 \rightarrow 6 \text{NaF} + 1 \text{Ca}_3\text{P}_2$
 - 36) $2 \text{Mn} + 6 \text{HI} \rightarrow 3 \text{H}_2 + 2 \text{MnI}_3$
 - 37) $1 \text{Li}_3\text{PO}_4 + 3 \text{NaBr} \rightarrow 1 \text{Na}_3\text{PO}_4 + 3 \text{LiBr}$
 - 38) $1 \text{CaF}_2 + 1 \text{Li}_2\text{SO}_4 \rightarrow 1 \text{CaSO}_4 + 2 \text{LiF}$
 - 39) $2 \text{HBr} + 1 \text{Mg(OH)}_2 \rightarrow 1 \text{MgBr}_2 + 2 \text{H}_2\text{O}$
 - 40) $2 \text{LiNO}_3 + 1 \text{CaBr}_2 \rightarrow 1 \text{Ca(NO}_3)_2 + 2 \text{LiBr}$
 - 41) $1 \text{AgNO}_3 + 1 \text{Li} \rightarrow 1 \text{LiNO}_3 + 1 \text{Ag}$
 - 42) $1 \text{Si(OH)}_4 + 4 \text{NaBr} \rightarrow 1 \text{SiBr}_4 + 4 \text{NaOH}$
 - 43) $2 \text{NaCN} + 1 \text{CuCO}_3 \rightarrow 1 \text{Na}_2\text{CO}_3 + 1 \text{Cu(CN)}$
- Challenge: $2 \text{C}_2\text{H}_6 + 7 \text{O}_2 \rightarrow 4 \text{CO}_2 + 6 \text{H}_2\text{O}$

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