

## BALANCING CHEMICAL EQUATIONS

Balance the following equations using the observation method.

- 1) \_\_\_  $\text{H}_3\text{PO}_4$  + \_\_\_  $\text{KOH}$   $\rightarrow$  \_\_\_  $\text{K}_3\text{PO}_4$  + \_\_\_  $\text{H}_2\text{O}$
- 2) \_\_\_  $\text{K}$  + \_\_\_  $\text{B}_2\text{O}_3$   $\rightarrow$  \_\_\_  $\text{K}_2\text{O}$  + \_\_\_  $\text{B}$
- 3) \_\_\_  $\text{HCl}$  + \_\_\_  $\text{NaOH}$   $\rightarrow$  \_\_\_  $\text{NaCl}$  + \_\_\_  $\text{H}_2\text{O}$
- 4) \_\_\_  $\text{Na}$  + \_\_\_  $\text{NaNO}_3$   $\rightarrow$  \_\_\_  $\text{Na}_2\text{O}$  + \_\_\_  $\text{N}_2$
- 5) \_\_\_  $\text{C}$  + \_\_\_  $\text{S}_8$   $\rightarrow$  \_\_\_  $\text{CS}_2$
- 6) \_\_\_  $\text{Na}$  + \_\_\_  $\text{O}_2$   $\rightarrow$  \_\_\_  $\text{Na}_2\text{O}$
- 7) \_\_\_  $\text{N}_2$  + \_\_\_  $\text{O}_2$   $\rightarrow$  \_\_\_  $\text{N}_2\text{O}_5$
- 8) \_\_\_  $\text{H}_3\text{PO}_4$  + \_\_\_  $\text{Mg}(\text{OH})_2$   $\rightarrow$  \_\_\_  $\text{Mg}_3(\text{PO}_4)_2$  + \_\_\_  $\text{H}_2\text{O}$
- 9) \_\_\_  $\text{NaOH}$  + \_\_\_  $\text{H}_2\text{CO}_3$   $\rightarrow$  \_\_\_  $\text{Na}_2\text{CO}_3$  + \_\_\_  $\text{H}_2\text{O}$
- 10) \_\_\_  $\text{KOH}$  + \_\_\_  $\text{HBr}$   $\rightarrow$  \_\_\_  $\text{KBr}$  + \_\_\_  $\text{H}_2\text{O}$
- 11) \_\_\_  $\text{Na}$  + \_\_\_  $\text{O}_2$   $\rightarrow$  \_\_\_  $\text{Na}_2\text{O}$
- 12) \_\_\_  $\text{Al}(\text{OH})_3$  + \_\_\_  $\text{H}_2\text{CO}_3$   $\rightarrow$  \_\_\_  $\text{Al}_2(\text{CO}_3)_3$  + \_\_\_  $\text{H}_2\text{O}$
- 13) \_\_\_  $\text{Al}$  + \_\_\_  $\text{S}_8$   $\rightarrow$  \_\_\_  $\text{Al}_2\text{S}_3$
- 14) \_\_\_  $\text{Cs}$  + \_\_\_  $\text{N}_2$   $\rightarrow$  \_\_\_  $\text{Cs}_3\text{N}$
- 15) \_\_\_  $\text{Mg}$  + \_\_\_  $\text{Cl}_2$   $\rightarrow$  \_\_\_  $\text{MgCl}_2$
- 16) \_\_\_  $\text{Rb}$  + \_\_\_  $\text{RbNO}_3$   $\rightarrow$  \_\_\_  $\text{Rb}_2\text{O}$  + \_\_\_  $\text{N}_2$
- 17) \_\_\_  $\text{C}_6\text{H}_6$  + \_\_\_  $\text{O}_2$   $\rightarrow$  \_\_\_  $\text{CO}_2$  + \_\_\_  $\text{H}_2\text{O}$
- 18) \_\_\_  $\text{N}_2$  + \_\_\_  $\text{H}_2$   $\rightarrow$  \_\_\_  $\text{NH}_3$
- 19) \_\_\_  $\text{C}_{10}\text{H}_{22}$  + \_\_\_  $\text{O}_2$   $\rightarrow$  \_\_\_  $\text{CO}_2$  + \_\_\_  $\text{H}_2\text{O}$
- 20) \_\_\_  $\text{Al}(\text{OH})_3$  + \_\_\_  $\text{HBr}$   $\rightarrow$  \_\_\_  $\text{AlBr}_3$  + \_\_\_  $\text{H}_2\text{O}$
- 21) \_\_\_  $\text{CH}_3\text{CH}_2\text{CH}_2\text{CH}_3$  + \_\_\_  $\text{O}_2$   $\rightarrow$  \_\_\_  $\text{CO}_2$  + \_\_\_  $\text{H}_2\text{O}$
- 22) \_\_\_  $\text{C}_3\text{H}_8$  + \_\_\_  $\text{O}_2$   $\rightarrow$  \_\_\_  $\text{CO}_2$  + \_\_\_  $\text{H}_2\text{O}$
- 23) \_\_\_  $\text{Li}$  + \_\_\_  $\text{AlCl}_3$   $\rightarrow$  \_\_\_  $\text{LiCl}$  + \_\_\_  $\text{Al}$
- 24) \_\_\_  $\text{C}_2\text{H}_6$  + \_\_\_  $\text{O}_2$   $\rightarrow$  \_\_\_  $\text{CO}_2$  + \_\_\_  $\text{H}_2\text{O}$
- 25) \_\_\_  $\text{NH}_4\text{OH}$  + \_\_\_  $\text{H}_3\text{PO}_4$   $\rightarrow$  \_\_\_  $(\text{NH}_4)_3\text{PO}_4$  + \_\_\_  $\text{H}_2\text{O}$
- 26) \_\_\_  $\text{Rb}$  + \_\_\_  $\text{P}$   $\rightarrow$  \_\_\_  $\text{Rb}_3\text{P}$
- 27) \_\_\_  $\text{CH}_4$  + \_\_\_  $\text{O}_2$   $\rightarrow$  \_\_\_  $\text{CO}_2$  + \_\_\_  $\text{H}_2\text{O}$
- 28) \_\_\_  $\text{Al}(\text{OH})_3$  + \_\_\_  $\text{H}_2\text{SO}_4$   $\rightarrow$  \_\_\_  $\text{Al}_2(\text{SO}_4)_3$  + \_\_\_  $\text{H}_2\text{O}$
- 29) \_\_\_  $\text{Na}$  + \_\_\_  $\text{Cl}_2$   $\rightarrow$  \_\_\_  $\text{NaCl}$
- 30) \_\_\_  $\text{Rb}$  + \_\_\_  $\text{S}_8$   $\rightarrow$  \_\_\_  $\text{Rb}_2\text{S}$
- 31) \_\_\_  $\text{H}_3\text{PO}_4$  + \_\_\_  $\text{Ca}(\text{OH})_2$   $\rightarrow$  \_\_\_  $\text{Ca}_3(\text{PO}_4)_2$  + \_\_\_  $\text{H}_2\text{O}$
- 32) \_\_\_  $\text{NH}_3$  + \_\_\_  $\text{HCl}$   $\rightarrow$  \_\_\_  $\text{NH}_4\text{Cl}$
- 33) \_\_\_  $\text{Li}$  + \_\_\_  $\text{H}_2\text{O}$   $\rightarrow$  \_\_\_  $\text{LiOH}$  + \_\_\_  $\text{H}_2$
- 34) \_\_\_  $\text{Ca}_3(\text{PO}_4)_2$  + \_\_\_  $\text{SiO}_2$  + \_\_\_  $\text{C}$   $\rightarrow$  \_\_\_  $\text{CaSiO}_3$  + \_\_\_  $\text{CO}$  + \_\_\_  $\text{P}$
- 35) \_\_\_  $\text{NH}_3$  + \_\_\_  $\text{O}_2$   $\rightarrow$  \_\_\_  $\text{N}_2$  + \_\_\_  $\text{H}_2\text{O}$
- 36) \_\_\_  $\text{FeS}_2$  + \_\_\_  $\text{O}_2$   $\rightarrow$  \_\_\_  $\text{Fe}_2\text{O}_3$  + \_\_\_  $\text{SO}_2$
- 37) \_\_\_  $\text{C}$  + \_\_\_  $\text{SO}_2$   $\rightarrow$  \_\_\_  $\text{CS}_2$  + \_\_\_  $\text{CO}$

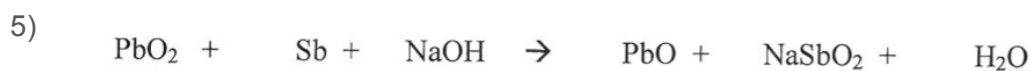
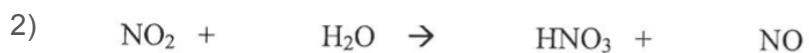
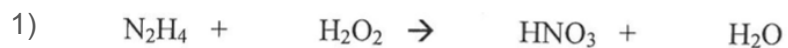
- 38)  $\text{AlBr}_3 + \text{K} \rightarrow \text{KBr} + \text{Al}$
- 39)  $\text{FeO} + \text{PdF}_2 \rightarrow \text{FeF}_2 + \text{PdO}$
- 40)  $\text{P}_4 + \text{Br}_2 \rightarrow \text{PBr}_3$
- 41)  $\text{LiCl} + \text{Br}_2 \rightarrow \text{LiBr} + \text{Cl}_2$
- 42)  $\text{PbBr}_2 + \text{HCl} \rightarrow \text{HBr} + \text{PbCl}_2$
- 43)  $\text{CoBr}_3 + \text{CaSO}_4 \rightarrow \text{CaBr}_2 + \text{Co}_2(\text{SO}_4)_3$
- 44)  $\text{Na}_3\text{P} + \text{CaF}_2 \rightarrow \text{NaF} + \text{Ca}_3\text{P}_2$
- 45)  $\text{Mn} + \text{HI} \rightarrow \text{H}_2 + \text{MnI}_3$
- 46)  $\text{Li}_3\text{PO}_4 + \text{NaBr} \rightarrow \text{Na}_3\text{PO}_4 + \text{LiBr}$
- 47)  $\text{CaF}_2 + \text{Li}_2\text{SO}_4 \rightarrow \text{CaSO}_4 + \text{LiF}$
- 48)  $\text{HBr} + \text{Mg}(\text{OH})_2 \rightarrow \text{MgBr}_2 + \text{H}_2\text{O}$
- 49)  $\text{LiNO}_3 + \text{CaBr}_2 \rightarrow \text{Ca}(\text{NO}_3)_2 + \text{LiBr}$
- 50)  $\text{AgNO}_3 + \text{Li} \rightarrow \text{LiNO}_3 + \text{Ag}$
- 51)  $\text{Si}(\text{OH})_4 + \text{NaBr} \rightarrow \text{SiBr}_4 + \text{NaOH}$
- 52)  $\text{NaCN} + \text{CuCO}_3 \rightarrow \text{Na}_2\text{CO}_3 + \text{Cu}(\text{CN})_2$
- 52)  $\text{SiCl}_4(\text{l}) + \text{H}_2\text{O}(\text{l}) \longrightarrow \text{SiO}_2(\text{s}) + \text{HCl}(\text{aq})$
- 53)  $\text{As} + \text{NaOH} \longrightarrow \text{Na}_3\text{AsO}_3 + \text{H}_2$
- 54)  $\text{Au}_2\text{S}_3 + \text{H}_2 \longrightarrow \text{Au} + \text{H}_2\text{S}$
- 55)  $\text{V}_2\text{O}_5 + \text{HCl} \longrightarrow \text{VOCl}_3 + \text{H}_2\text{O}$
- 56)  $\text{Hg}(\text{OH})_2 + \text{H}_3\text{PO}_4 \longrightarrow \text{Hg}_3(\text{PO}_4)_2 + \text{H}_2\text{O}$
- 57)  $\text{SiO}_2 + \text{HF} \longrightarrow \text{SiF}_4 + \text{H}_2\text{O}$
- 58)  $\text{Zn} + \text{HCl} \longrightarrow \text{ZnCl}_2 + \text{H}_2$
- 59)  $\text{HClO}_4 + \text{P}_4\text{O}_{10} \longrightarrow \text{H}_3\text{PO}_4 + \text{Cl}_2\text{O}_7$
- 60)  $\text{N}_2(\text{g}) + \text{O}_2(\text{g}) + \text{H}_2\text{O} \longrightarrow \text{HNO}_3(\text{aq})$

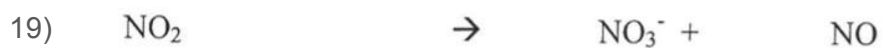
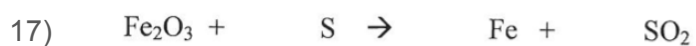
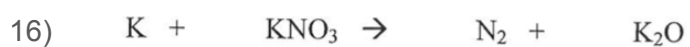
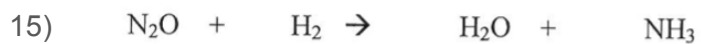
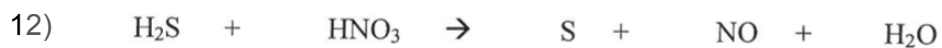
## Balancing Chemical Equations Worksheet

1. \_\_\_\_\_ H<sub>2</sub> + \_\_\_\_\_ O<sub>2</sub> → \_\_\_\_\_ H<sub>2</sub>O
2. \_\_\_\_\_ N<sub>2</sub> + \_\_\_\_\_ H<sub>2</sub> → \_\_\_\_\_ NH<sub>3</sub>
3. \_\_\_\_\_ S<sub>8</sub> + \_\_\_\_\_ O<sub>2</sub> → \_\_\_\_\_ SO<sub>3</sub>
4. \_\_\_\_\_ N<sub>2</sub> + \_\_\_\_\_ O<sub>2</sub> → \_\_\_\_\_ N<sub>2</sub>O
5. \_\_\_\_\_ HgO → \_\_\_\_\_ Hg + \_\_\_\_\_ O<sub>2</sub>
6. \_\_\_\_\_ CO<sub>2</sub> + \_\_\_\_\_ H<sub>2</sub>O → \_\_\_\_\_ C<sub>6</sub>H<sub>12</sub>O<sub>6</sub> + \_\_\_\_\_ O<sub>2</sub>
7. \_\_\_\_\_ Zn + \_\_\_\_\_ HCl → \_\_\_\_\_ ZnCl<sub>2</sub> + \_\_\_\_\_ H<sub>2</sub>
8. \_\_\_\_\_ SiCl<sub>4</sub> + \_\_\_\_\_ H<sub>2</sub>O → \_\_\_\_\_ H<sub>4</sub>SiO<sub>4</sub> + \_\_\_\_\_ HCl
9. \_\_\_\_\_ Na + \_\_\_\_\_ H<sub>2</sub>O → \_\_\_\_\_ NaOH + \_\_\_\_\_ H<sub>2</sub>
10. \_\_\_\_\_ H<sub>3</sub>PO<sub>4</sub> → \_\_\_\_\_ H<sub>4</sub>P<sub>2</sub>O<sub>7</sub> + \_\_\_\_\_ H<sub>2</sub>O
11. \_\_\_\_\_ C<sub>10</sub>H<sub>16</sub> + \_\_\_\_\_ Cl<sub>2</sub> → \_\_\_\_\_ C + \_\_\_\_\_ HCl
12. \_\_\_\_\_ CO<sub>2</sub> + \_\_\_\_\_ NH<sub>3</sub> → \_\_\_\_\_ OC(NH<sub>2</sub>)<sub>2</sub> + \_\_\_\_\_ H<sub>2</sub>O
13. \_\_\_\_\_ Si<sub>2</sub>H<sub>3</sub> + \_\_\_\_\_ O<sub>2</sub> → \_\_\_\_\_ SiO<sub>2</sub> + \_\_\_\_\_ H<sub>2</sub>O<sub>3</sub>
14. \_\_\_\_\_ Al(OH)<sub>3</sub> + \_\_\_\_\_ H<sub>2</sub>SO<sub>4</sub> → \_\_\_\_\_ Al<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> + \_\_\_\_\_ H<sub>2</sub>O
15. \_\_\_\_\_ Fe + \_\_\_\_\_ O<sub>2</sub> → \_\_\_\_\_ Fe<sub>2</sub>O<sub>3</sub>
16. \_\_\_\_\_ Fe<sub>2</sub>(SO<sub>4</sub>)<sub>3</sub> + \_\_\_\_\_ KOH → \_\_\_\_\_ K<sub>2</sub>SO<sub>4</sub> + \_\_\_\_\_ Fe(OH)<sub>3</sub>
17. \_\_\_\_\_ C<sub>7</sub>H<sub>6</sub>O<sub>2</sub> + \_\_\_\_\_ O<sub>2</sub> → \_\_\_\_\_ CO<sub>2</sub> + \_\_\_\_\_ H<sub>2</sub>O
18. \_\_\_\_\_ H<sub>2</sub>SO<sub>4</sub> + \_\_\_\_\_ HI → \_\_\_\_\_ H<sub>2</sub>S + \_\_\_\_\_ I<sub>2</sub> + \_\_\_\_\_ H<sub>2</sub>O
19. \_\_\_\_\_ FeS<sub>2</sub> + \_\_\_\_\_ O<sub>2</sub> → \_\_\_\_\_ Fe<sub>2</sub>O<sub>3</sub> + \_\_\_\_\_ SO<sub>2</sub>
20. \_\_\_\_\_ Al + \_\_\_\_\_ FeO → \_\_\_\_\_ Al<sub>2</sub>O<sub>3</sub> + \_\_\_\_\_ Fe
21. \_\_\_\_\_ Fe<sub>2</sub>O<sub>3</sub> + \_\_\_\_\_ H<sub>2</sub> → \_\_\_\_\_ Fe + \_\_\_\_\_ H<sub>2</sub>O
22. \_\_\_\_\_ Na<sub>2</sub>CO<sub>3</sub> + \_\_\_\_\_ HCl → \_\_\_\_\_ NaCl + \_\_\_\_\_ H<sub>2</sub>O + \_\_\_\_\_ CO<sub>2</sub>
23. \_\_\_\_\_ K + \_\_\_\_\_ Br<sub>2</sub> → \_\_\_\_\_ KBr
24. \_\_\_\_\_ C<sub>7</sub>H<sub>16</sub> + \_\_\_\_\_ O<sub>2</sub> → \_\_\_\_\_ CO<sub>2</sub> + \_\_\_\_\_ H<sub>2</sub>O
25. \_\_\_\_\_ P<sub>4</sub> + \_\_\_\_\_ O<sub>2</sub> → \_\_\_\_\_ P<sub>2</sub>O<sub>5</sub>

26. Dicarbon dihydride + Oxygen → Carbon dioxide + Water
27. Potassium oxide + Water → Potassium hydroxide
28. Hydrogen peroxide → Water + Oxygen
29. Aluminum + Oxygen → Aluminum oxide
30. Sodium peroxide + Water → Sodium hydroxide + oxygen
31. Silicon dioxide + Hydrogen fluoride → Silicon tetrafluoride + Water
32. Carbon + water → Carbon monoxide + Hydrogen
33. Potassium chlorate → Potassium chloride + Oxygen
34. Potassium chlorate → Potassium perchlorate + Potassium chloride
35. Aluminum sulfate + Calcium hydroxide → Aluminum hydroxide + Calcium sulfate
36. Tetraphosphorus decoxide + Water → Hydrogen phosphate
37. Iron III chloride + Ammonium hydroxide → Iron III hydroxide + Ammonium chloride
38. Antimony + Oxygen → Tetrantimony Hexoxide
39. Tricarbon octahydride + Oxygen → Carbon dioxide + water
40. Dinitrogen pentoxide + Water → Hydrogen nitrate
41. Nitrogen trihydride + Nitrogen monoxide → Nitrogen + Water
42. Aluminum + Hydrogen chloride → Aluminum chloride + Hydrogen
43. Phosphorus pentachloride + water → Hydrogen chloride + Hydrogen phosphate
44. Magnesium + Nitrogen → Magnesium nitride
45. Iron + Water → Iron III oxide + Hydrogen
46. Sodium hydroxide + Chlorine → Sodium chloride + Sodium hypochlorite + water
47. Lithium oxide + Water → Lithium hydroxide
48. Ammonium nitrate → Dinitrogen monoxide + water
49. Lead II nitrate → Lead II oxide + Nitrogen dioxide + Oxygen
50. Calcium chlorate → Calcium chloride + Oxygen

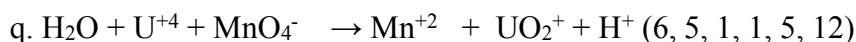
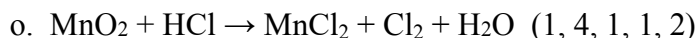
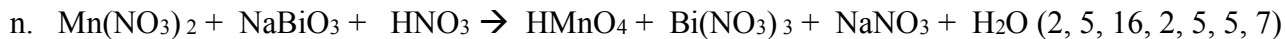
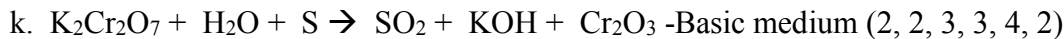
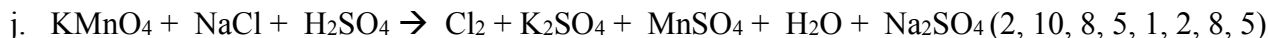
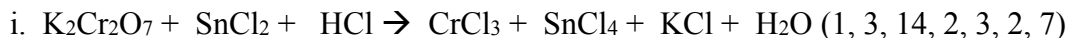
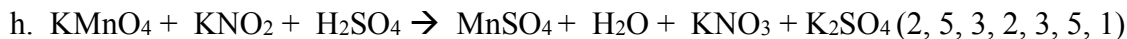
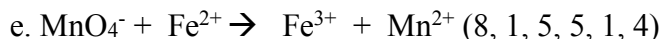
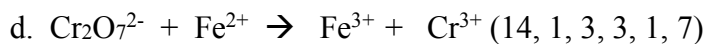
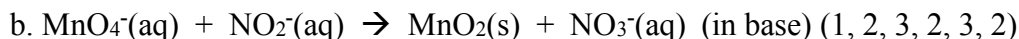
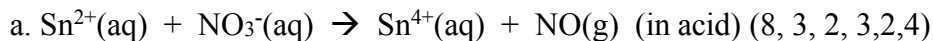
**Balance the following reactions using the Redox method**



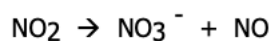
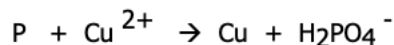
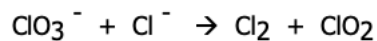
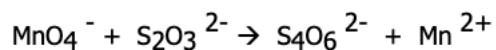
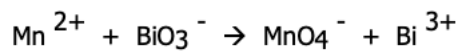


## REDOX EQUATIONS

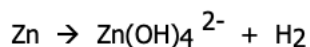
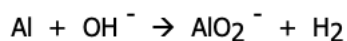
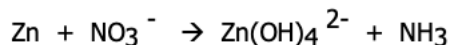
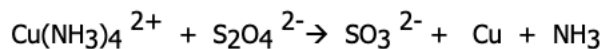
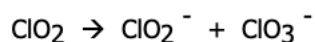
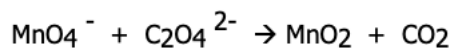
Balance the following equations.



Balance each redox reaction in acid solution.

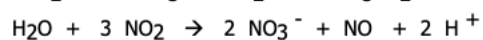
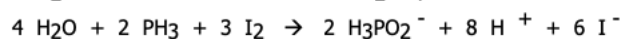
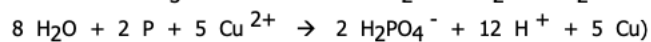
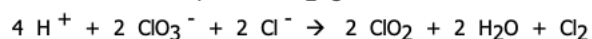
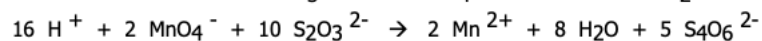
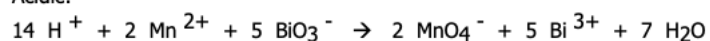


Basic Solutions

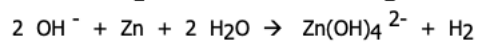
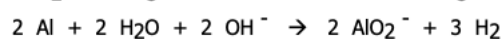
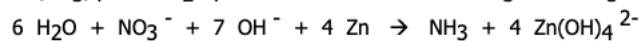
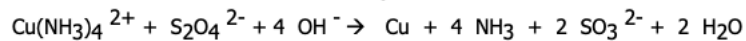
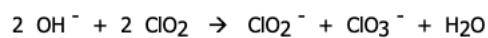
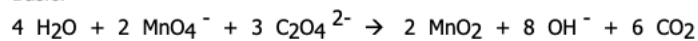


Answers

Acidic:



Basic:

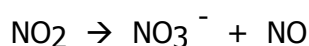
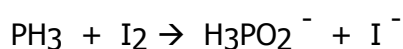
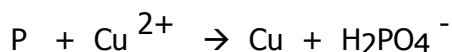
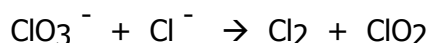
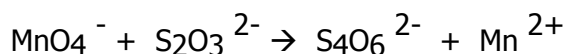
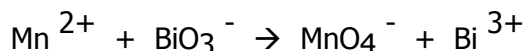




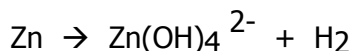
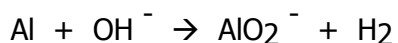
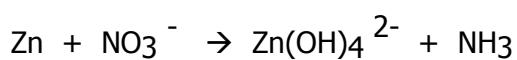
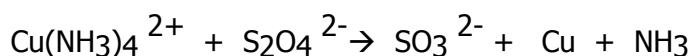
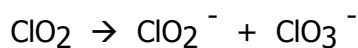
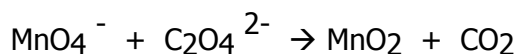
# Balancing Redox Reactions Worksheet 1

---

Balance each redox reaction in acid solution.

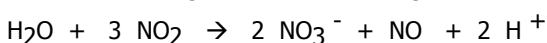
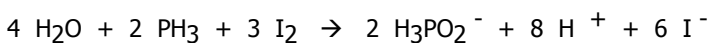
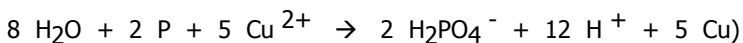
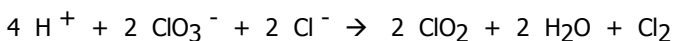
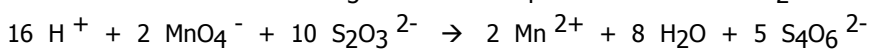
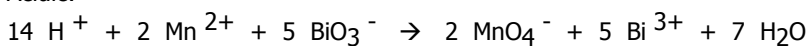


Basic Solutions

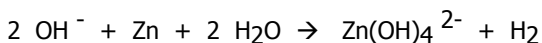
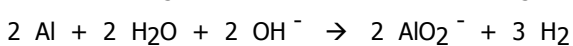
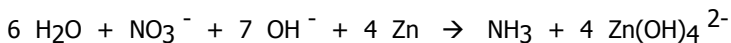
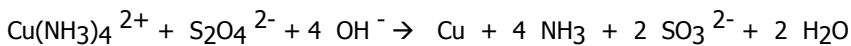
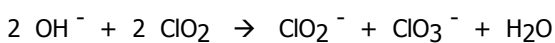
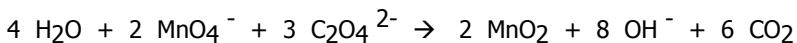


Answers

Acidic:



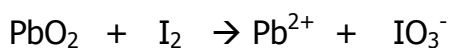
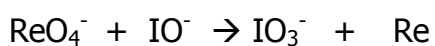
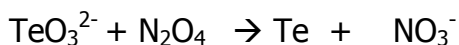
Basic:



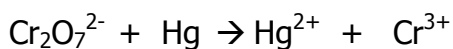
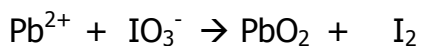
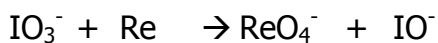
# Balancing Redox Reactions Worksheet 2

---

Balance each redox reaction in acid solution.



Balance each redox reaction in basic solution.



Answers:

