

1. Assign oxidation #s.
2. Identify species oxidized and reduced.
3. Balance.

REDOX REACTIONS

117

15. $\text{FeS} + \text{HNO}_3 \rightarrow \text{Fe}(\text{NO}_3)_3 + \text{NO} + \text{S} + \text{H}_2\text{O}$
16. $\text{AgNO}_3 + \text{NaClO} \rightarrow \text{AgCl} + \text{AgClO}_3 + \text{NaNO}_3$
17. $\text{Ca}(\text{OH})_2 + \text{Cl}_2 \rightarrow \text{CaCl}_2 + \text{Ca}(\text{ClO}_3)_2 + \text{H}_2\text{O}$
18. $\text{MnO}_2 + \text{FeSO}_4 + \text{H}_2\text{SO}_4 \rightarrow \text{MnSO}_4 + \text{Fe}_2(\text{SO}_4)_3 + \text{H}_2\text{O}$
19. $\text{I}_2 + \text{Na}_2\text{S}_2\text{O}_3 \rightarrow \text{Na}_2\text{S}_4\text{O}_6 + \text{NaI}$
20. $\text{Bi}(\text{NO}_3)_3 + \text{Al} + \text{NaOH} \rightarrow \text{Bi} + \text{NH}_3 + \text{NaAlO}_2$
21. $\text{Cu}_2\text{As}_2\text{O}_7 + \text{Zn} + \text{H}_2\text{SO}_4 \rightarrow \text{Cu} + \text{AsH}_3 + \text{ZnSO}_4 + \text{H}_2\text{O}$
22. $\text{FeCl}_2 + \text{HCl} + \text{HNO}_3 \rightarrow \text{FeCl}_3 + \text{NO} + \text{H}_2\text{O}$
23. $\text{PbCrO}_4 + \text{HCl} \rightarrow \text{PbCl}_2 + \text{CrCl}_3 + \text{Cl}_2 + \text{H}_2\text{O}$
24. $\text{K}_2\text{Cr}_2\text{O}_7 + \text{HCl} + \text{H}_2\text{S} \rightarrow \text{KCl} + \text{CrCl}_3 + \text{S} + \text{H}_2\text{O}$
25. $\text{Ag} + \text{HNO}_3 + \text{Ca}(\text{ClO})_2 \rightarrow \text{AgCl} + \text{Ca}(\text{NO}_3)_2 + \text{H}_2\text{O}$
26. $\text{HgS} + \text{HCl} + \text{HNO}_3 \rightarrow \text{HgCl}_2 + \text{S} + \text{NO} + \text{H}_2\text{O}$
27. $\text{Na}_2\text{Cr}_2\text{O}_7 + \text{HNO}_3 + \text{H}_2\text{O}_2 \rightarrow \text{H}_3\text{CrO}_8 + \text{NaNO}_3 + \text{H}_2\text{O}$
28. $\text{K}_2\text{MnO}_4 + \text{HNO}_3 \rightarrow \text{KMnO}_4 + \text{MnO}_2 + \text{KNO}_3 + \text{H}_2\text{O}$
29. $\text{KMnO}_4 + \text{NaNO}_2 + \text{HCl} \rightarrow \text{KCl} + \text{MnCl}_2 + \text{NaNO}_3 + \text{H}_2\text{O}$
30. $\text{MnCl}_2 + \text{NaOH} + \text{Br}_2 \rightarrow \text{MnO}_2 + \text{NaCl} + \text{NaBr} + \text{H}_2\text{O}$