

Rules for Balancing Redox Equations

1. Write the skeleton equation for the reaction.
2. Assign oxidation numbers to all elements and determine what is being oxidized and what is being reduced. Ignore everything else for now.
3. Write the electronic equations for the oxidation and reduction processes.
4. Adjust the coefficients in both equations so that the number of electrons lost equals the number of electrons gained.
5. Place these coefficients back into the skeleton equation.
6. Now balance the entire equation for conservation of atoms.

1. $\text{Fe} + \text{Cl}_2 \rightarrow \text{FeCl}_3$
2. $\text{KOH} + \text{Cl}_2 \rightarrow \text{KClO}_3 + \text{KCl} + \text{H}_2\text{O}$
3. $\text{H}_2 + \text{Cl}_2 \rightarrow \text{HCl}$
4. $\text{Cl}_2 + \text{H}_2\text{O} \rightarrow \text{HCl} + \text{HClO}$
5. $\text{KI} + \text{Br}_2 \rightarrow \text{KBr} + \text{I}_2$
6. $\text{H}_2\text{S} + \text{Cl}_2 \rightarrow \text{S} + \text{HCl}$
7. $\text{HNO}_3 + \text{H}_2\text{S} \rightarrow \text{H}_2\text{O} + \text{S} + \text{NO}$
8. $\text{H}_2\text{S} + \text{O}_2 \rightarrow \text{S} + \text{H}_2\text{O}$
9. $\text{H}_2\text{S} + \text{Br}_2 \rightarrow \text{S} + \text{HBr}$
10. $\text{HNO}_3 + \text{CuS} \rightarrow \text{NO}_2 + \text{Cu}(\text{NO}_3)_2 + \text{H}_2\text{O} + \text{SO}_2$
11. $\text{KMnO}_4 + \text{HCl} \rightarrow \text{Cl}_2 + \text{KCl} + \text{H}_2\text{O} + \text{MnCl}_2$
12. $\text{CuS} + \text{I}_2 + \text{HCl} \rightarrow \text{S} + \text{HI} + \text{CuCl}_2$
13. $\text{As}_2\text{S}_5 + \text{HNO}_3 \rightarrow \text{NO}_2 + \text{H}_2\text{O} + \text{H}_3\text{AsO}_4 + \text{H}_2\text{SO}_4$
14. $\text{H}_2\text{SO}_4 + \text{HI} \rightarrow \text{H}_2\text{S} + \text{H}_2\text{O} + \text{I}_2$
15. $\text{HNO}_3 + \text{S} \rightarrow \text{NO}_2 + \text{H}_2\text{SO}_4 + \text{H}_2\text{O}$
16. $\text{CrCl}_3 + \text{MnO}_2 + \text{H}_2\text{O} \rightarrow \text{MnCl}_2 + \text{H}_2\text{CrO}_4$
17. $\text{KMnO}_4 + \text{HCl} + \text{H}_2\text{S} \rightarrow \text{KCl} + \text{MnCl}_2 + \text{S} + \text{H}_2\text{O}$
18. $\text{HNO}_3 + \text{S} \rightarrow \text{NO} + \text{H}_2\text{SO}_4$
19. $\text{HNO}_3 + \text{H}_2\text{S} \rightarrow \text{H}_2\text{SO}_4 + \text{NO}_2 + \text{H}_2\text{O}$
20. $\text{HNO}_3 + \text{P} \rightarrow \text{H}_3\text{PO}_4 + \text{NO}_2 + \text{H}_2\text{O}$