

All Chemical Reactions

1. $C + O_2 \rightarrow CO_2$
2. $C + CO_2 \rightarrow 2CO$
3. $3CO + Fe_2O_3 \rightarrow 3CO_2 + 2Fe$
4. $CaCO_3 \rightarrow CaO + CO_2$
5. $CaO + SiO_2 \rightarrow CaSiO_3$

Reactions in the Blast Furnace

(Metals)

(Water)

(Alkaline)

1. Group 1 Elements (Metals) + H₂O → Metal OH + Hydrogen Gas

2. Acid + Metal → Salt + Hydrogen Gas (Copper, Silver, Gold DO NOT REACT)

3. Acid + Bases → Salt + Water

(Metal Oxide/Hydroxide)

4. Acid + Carbonate → Salt + Water + Carbon Dioxide

5. Alkalis (Metal Hydroxide) + Ammonia Salts → Ammonia gas + Water + Salt

6. Acidic Oxide + Water → Acid

7. Acidic Oxide + Air → Acid

8. Acidic Oxide + Alkalis → Salt + Water

9. Basic Oxide + Acid → Salt + Water

Similar to ACID + BASE → SALT + WATER

10. Hydrocarbon + Air → Carbon Dioxide + Water

Burns in

Note: Alkanes can only react with chlorine (Substitution) or react with air (Combustion). Otherwise, it is unreactive.

11. **Alkane + Chlorine → Chloroalkane + HCl** (Substitution reaction)

12. **Alkene + Bromine → Bromoethane** (reaction used to test for alkenes)

13. **Alkene + Steam → Alcohol** (Needs Phosphoric acid as catalyst, high temp, pressure!)

14. **Alkene + Hydrogen → Alkane** (Needs Nickel Catalyst)

Addition Reactions

(C=C Bonds in alkenes are broken)

15. **Glucose + Yeast → Ethanol + CO₂** (Fermentation Reaction)

16. **Alcohol + Air → Carbon Dioxide + water** (Combustion reaction)

17. **Alcohol OXIDISED → Organic Acids + water** (Oxidation)

18. **Acid + Alcohol → Ester + Water** (Esterification)

19. **Ethanoic Acid + Ethanol → Ethyl Ethanoate** (Esterification)

Ester

Conditions for Fermentation:

- 37°C
- Enzymes in yeast
- No Oxygen present

20. **Alkanes → Small Alkane + Alkene** (Cracking)