

# Examples using mhchem

1. Covalent compounds:  $\text{H}_2\text{O}$
2. Ionic compounds:  $\text{NaCl}$
3. Hydrates:  $\text{CuSO}_4 \cdot 5 \text{H}_2\text{O}$
4. Stoichiometry:  $2 \text{H}_2 + \text{O}_2 \longrightarrow 2 \text{H}_2\text{O}$
5. Acids and bases:  $\text{HCl} + \text{NaOH} \longrightarrow \text{NaCl} + \text{H}_2\text{O}$
6. Chemical equation:  $\text{H}_2\text{O} \longrightarrow \text{H}^+ + \text{OH}^-$
7. Simple Isotopes:  $^{14}\text{C}$
8. Isotopes:  $^{227}_{90}\text{Th}^+$
9. Reaction arrows:  $\text{A} \xrightarrow{\text{H}_2\text{O}} \text{B}$
10. States of matter:  $\text{H}_2\text{O}(\text{l}) \longrightarrow \text{H}_2\text{O}(\text{g})$
11. States of aggregation:  $\text{H}_2(\text{g}) + \text{O}_2(\text{g}) \longrightarrow \text{H}_2\text{O}(\text{l})$
12. Charges:  $\text{SO}_4^{2-}$
13. Charges:  $\text{SO}_4^{2-} + \text{Ba}^{2+} \longrightarrow \text{BaSO}_4 \downarrow$
14. Oxidation states:  $\text{Fe}^{3+} + \text{Cr}_2\text{O}_7^{2-} \longrightarrow \text{Fe}^{2+} + \text{Cr}^{3+}$
15. Equilibrium arrows:  $\text{CO}_2 + \text{H}_2\text{O} \rightleftharpoons \text{H}_2\text{CO}_3$
16. Equilibrium arrows:  $\text{CO}_2 + \text{H}_2\text{O} \rightleftharpoons \text{H}^+ + \text{HCO}_3^-$
17. Precipitation:  $\text{AgCl}(\text{s}) \rightleftharpoons \text{Ag}^+ + \text{Cl}^-$
18. Acids and bases:  $\text{HCl} + \text{NaOH} \longrightarrow \text{NaCl} + \text{H}_2\text{O}$
19. Complex ions:  $[\text{Cu}(\text{NH}_3)_4(\text{H}_2\text{O})_2]^{2+}$
20. Hydrates:  $\text{CuSO}_4 \cdot 5 \text{H}_2\text{O}$
21. Organic compounds:  $\text{CH}_3\text{CH}_2\text{OH}$
22. Polymers:  $(\text{C}_2\text{H}_4)_n$
23. Biochemical compounds:  $\text{ATP} + \text{H}_2\text{O} \longrightarrow \text{ADP} + \text{Pi} + \text{H}^+$
24. Nuclear reactions:  $^{14}_6\text{C} \longrightarrow ^{14}_7\text{N} + \text{e}^- + \bar{\nu}_e$
25. Redox reactions:  $\text{Zn} + \text{Cu}^{2+} \longrightarrow \text{Zn}^{2+} + \text{Cu}$
26. Ionic equations:  $\text{Ag}^+(\text{aq}) + \text{Cl}^-(\text{aq}) \longrightarrow \text{AgCl}(\text{s})$
27. Half-reactions:  
Oxidation half-reaction:  $\text{Zn} \longrightarrow \text{Zn}^{2+} + 2 \text{e}^-$   
Reduction half-reaction:  $\text{Cu}^{2+} + 2 \text{e}^- \longrightarrow \text{Cu}$
28. Reaction mechanisms:  
Step 1:  $\text{NO}_2 + \text{NO}_3 \longrightarrow \text{NO} + \text{NO}_2 + \text{O}_2$   
Step 2:  $\text{NO} + \text{O}_3 \longrightarrow \text{NO}_2 + \text{O}_2$   
Overall reaction:  $\text{NO}_3 + \text{O}_3 \longrightarrow \text{NO}_2 + \text{O}_2 + \text{O}_2$