Examples using mhchem

1. Covalent compounds: $\ce{H2O}$
2. Ionic compounds: $\ce{NaCl}$
3. Hydrates: $\ce{CuSO4 * 5 H2O}$
4. Stoichiometry: $\ce{2 H2 + O2 -> 2 H2O}$
5. Acids and bases: $\ce{HCl + NaOH -> NaCl + H2O}$
6. Chemical equation: $\ce{H2O -> H+ + OH-}$
7. Simple Isotopes: $\ce{^{14}C}$
8. Isotopes: $\ce{^{227}_{90}Th+}$
9. Reaction arrows: $\ce{A ->[H2O] B}$
10. States of matter: $\ce{H2O(l) -> H2O(g)}$
11. States of aggregation: $\ce{H2(g) + O2(g) -> H2O(l)}$
12. Charges: $\ce{SO4^2-}$
13. Charges: $\ce{SO4^2- + Ba^2+ -> BaSO4 v}$
14. Oxidation states: $\ce{Fe^3+ + Cr2O7^2- -> Fe^2+ + Cr^3+}$
15. Equilibrium arrows: $\ce{CO2 + H2O <=> H2CO3}$
16. Equilibrium arrows: $\ce{CO2 + H2O <=>> H+ + HCO3-}$
17. Equilibrium: $\ce{K = \frac{[Hg^2+][Hg]}{[Hg2^2+]}}$
18. Precipitation: $\ce{AgCl(s) <=> Ag+ + Cl-}$
19. Acids and bases: $\ce{HCl + NaOH -> NaCl + H2O}$
20. Complex ions: $\ce{[Cu(NH3)4(H2O)2]^2+}$
21. Hydrates: $\ce{CuSO4 * 5 H2O}$
22. Organic compounds: $\ce{CH3CH2OH}$
23. Polymers: $\ce{(C2H4)_n}$
24. Biochemical compounds: $\ce{ATP + H2O -> ADP + Pi + H+}$
25. Nuclear reactions: $\ce{^{14}_6C -> ^{14}_7N + e- + \bar{\nu}_e}$
26. Redox reactions: $\ce{Zn + Cu^2+ -> Zn^2+ + Cu}$
27. Ionic equations: $\ce{Ag+(aq) + Cl-(aq) -> AgCl(s)}$
28. Half-reactions:
    Oxidation half-reaction: $\ce{Zn -> Zn^2+ + 2 e-}$
    Reduction half-reaction: $\ce{Cu^2+ + 2 e- -> Cu}$
29. Reaction mechanisms:
    Step 1: $\ce{NO2 + NO3 -> NO + NO2 + O2}$
    Step 2: $\ce{NO + O3 -> NO2 + O2}$
    Overall reaction: $\ce{NO3 + O3 -> NO2 + O2 + O2}$