CLASSIFYING CHEMICAL REACTIONS

Oxidation-Reduction Reactions

Type of Reaction	Examples	Signature	Comments
Synthesis (or Combination)	Generic: $\mathbf{A + X \rightarrow AX}$ $S(s) + O_2(g) \rightarrow SO_2(g)$	One Product	Redox when elements to compound
Decomposition	Generic: $\mathbf{AX \rightarrow A + X}$ $2\,H_2O(l) \xrightarrow{\ electricity\ } 2\,H_2(g) + O_2(g)$	One Reactant	Redox when compound to elements
Single Replacement	Generic: $\mathbf{A + BX \rightarrow AX + B}$ $2\,Al(s) + 3\,CuCl_2(aq) \rightarrow 3\,Cu(s) + 2\,AlCl_3(aq)$ $Cl_2(g) + 2\,HBr(aq) \rightarrow Br_2(l) + 2\,HCl(aq)$		Always Redox
Combustion	Generic: **[compound with C, H and/or O] + $O_2(g)$ $\rightarrow$ $CO_2(g)$ + $H_2O(l)$** $CH_4 + 2\,O_2(g) \rightarrow CO_2(g) + 2\,H_2O(l)$ $2\,C_2H_6 + 7\,O_2(g) \rightarrow 4\,CO_2(g) + 6\,H_2O(l)$		Always Redox

NOT Oxidation-Reduction

Type of Reaction	Examples	Signature	Comments
Double Displacement	Generic: $\mathbf{AX + BY \rightarrow AY + BX}$ **Precipitation**: $BaCl_2(aq) + K_2CO_3(aq) \rightarrow BaCO_3(s) + 2\,KCl(aq)$ **Acid-Base**: $HCl(aq) + NaOH(aq) \rightarrow H_2O(l) + 2\,NaCl(aq)$		