

Reactions of acids, bases, and acidic, basic, and neutral salts:

Chemical	Example rxn	Equilibrium?	In the beaker (picture)
Strong acid	$\text{HCl}_{(aq)} + \text{H}_2\text{O}_{(l)} \rightarrow \text{Cl}^-_{(aq)} + \text{H}_3\text{O}^+_{(aq)}$	no	$\text{Cl}^-$ , $\text{H}^+$ (products only)
Weak acid	$\text{HF}_{(aq)} + \text{H}_2\text{O}_{(l)} \rightleftharpoons \text{F}^-_{(aq)} + \text{H}_3\text{O}^+_{(aq)}$	yes	$\text{HF}$ , $\text{F}^-$ , $\text{H}^+$ (both sides)
Strong base	$\text{NaOH}(s) \rightarrow \text{Na}^+_{(aq)} + \text{OH}^-_{(aq)}$ (does not react with water, dissolves in it)	no	$\text{Na}^+$ , $\text{OH}^-$ (products only)
Weak base	$\text{NH}_3(aq) + \text{H}_2\text{O}(l) \rightleftharpoons \text{OH}^-_{(aq)} + \text{NH}_4^+_{(aq)}$	yes	$\text{NH}_3$ , $\text{OH}^-$ , $\text{NH}_4^+$ (both sides)
Acidic salt	$\text{NH}_4\text{Cl} \rightarrow \text{NH}_4^+_{(aq)} + \text{Cl}^-_{(aq)}$ (does not react with water, dissolves in it) then the non neutral ion (conjugate acid) reacts further with water $\text{NH}_4^+_{(aq)} + \text{H}_2\text{O}(l) \rightleftharpoons \text{NH}_3(aq) + \text{H}_3\text{O}^+_{(aq)}$	yes	$\text{NH}_3$ , $\text{H}^+$ , $\text{NH}_4^+$ , $\text{Cl}^-$ (both sides)
Basic salt	$\text{KF} \rightarrow \text{K}^+_{(aq)} + \text{F}^-_{(aq)}$ (does not react with water, dissolves in it) then the non neutral ion (conjugate base) reacts further with water $\text{F}^-_{(aq)} + \text{H}_2\text{O}(l) \rightleftharpoons \text{HF}_{(aq)} + \text{OH}^-_{(aq)}$	yes	$\text{HF}$ , $\text{F}^-$ , $\text{OH}^-$ , $\text{K}^+$ (both sides)
Neutral salt	$\text{NaCl} \rightarrow \text{Na}^+_{(aq)} + \text{Cl}^-_{(aq)}$ (does not react with water, dissolves in it) both ions are neutral so no further reaction	no	$\text{Na}^+$ , $\text{Cl}^-$ (products only)