

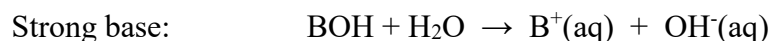
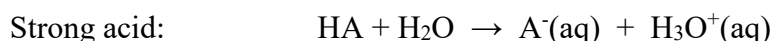
## Strong and Weak Acids and Bases

**The most common strong acids and bases, and some examples of weak acids and bases, together with definition of strong and weak acids and bases.**

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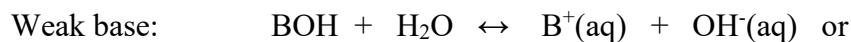
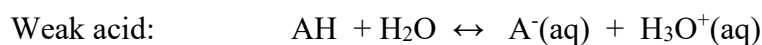
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A **strong acid** or a **strong base** completely ionizes (dissociates) in a solution. In water, one mole of a strong acid HA dissolves yielding one mole of H<sup>+</sup> (as hydronium ion H<sub>3</sub>O<sup>+</sup>) and one mole of the conjugate base, A<sup>-</sup>. Essentially, none of the non-ionized acid HA remains.



Examples of strong acids and bases are given in the table below. In aqueous solution, each of these *essentially ionizes 100%*.

A **weak acid** or a **weak base** only **partially dissociates**. *At equilibrium, both the acid and the conjugate base are present in solution*



Examples of weak acids and bases are given in the table below.

Stronger acids have a larger acid dissociation constant (K<sub>a</sub>) and a smaller logarithmic constant (pK<sub>a</sub> = -log K<sub>a</sub>) than weaker acids. The stronger an acid is, the more easily it loses a proton, H<sup>+</sup>.

Two key factors that contribute to the ease of deprotonation are the polarity of the H—A bond and the size of atom A, which determines the strength of the H—A bond. Acid strengths also depend on the stability of the conjugate base.

Stong Acids		Strong Bases	
Hydrobromic acid	HBr	Barium hydroxide	Ba(OH) <sub>2</sub>
Hydrochloric acid	HCl	Calsium hydroxide	Ca(OH) <sub>2</sub>
Hydroiodic acid	HI	Lithium hydroxide	LiOH
Nitric acid	HNO <sub>3</sub>	Potassium hydroxide	KOH
Perchloric acid	HClO <sub>4</sub>	Sodium hydroxide	NaOH
Sulfuric acid	H <sub>2</sub> SO <sub>4</sub>	Strontium hydroxide	Sr(OH) <sub>2</sub>
Weak acids		Weak bases	
Acetic acid	CH <sub>3</sub> COOH	Ammonia	NH <sub>3</sub>
Carbonic acid	H <sub>2</sub> CO <sub>3</sub>	Diethylamine	(CH <sub>3</sub> CH <sub>2</sub> ) <sub>2</sub> NH
Formic acid	CHOOH	Methylamine	CH <sub>3</sub> NH <sub>2</sub>
Hydrocyanic acid	HCN	Sodium bicarbonate	NaHCO <sub>3</sub>
Hydrofluoric acid	HF		
Phosphoric acid	H <sub>3</sub> PO <sub>4</sub>		