[**Strong and Weak Acids and Bases**](https://www.engineeringtoolbox.com/acid-base-strong-weak-d_1962.html)

**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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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+ (as hydronium ion H3O+) and one mole of the conjugate base, A−.  Essentially, none of the non-ionized acid HA remains.

Strong acid:                   HA + H2O  →  A-(aq)  +  H3O+(aq)

Strong base:                 BOH + H2O  →  B+(aq)  +  OH-(aq)

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*

Weak acid:                 AH  + H2O  ↔   A-(aq)  +  H3O+(aq)

   Weak base:              BOH  +   H2O   ↔    B+(aq)   +   OH-(aq)   or

                                    B  +  H2O   ↔    BH+(aq)   +  OH-(aq)

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

Stronger acids have a larger acid dissociation constant (Ka) and a smaller logarithmic constant (pKa = −log Ka) than weaker acids. The stronger an acid is, the more easily it loses a proton, H+.

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)2 |
| Hydrochloric acid | HCl | Calsium hydroxide | Ca(OH)2 |
| Hydroiodic acid | HI | Lithium hydroxide | LiOH |
| Nitric acid | HNO3 | Potassium hydroxide | KOH |
| Perchloric acid | HClO4 | Sodium hydroxide | NaOH |
| Sulfuric acid | H2SO4 | Strontium hydroxide | Sr(OH)2 |

| **Weak acids** | **Weak bases** |
| --- | --- |
| Acetic acid | CH3COOH | Ammonia  | NH3 |
| Carbonic acid | H2CO3 | Diethylamine | (CH3CH2)2NH |
| Formic acid | CHOOH | Methylamine | CH3NH2 |
| Hydrocyanic acid | HCN | Sodium bicarbonate | NaHCO3 |
| Hydrofluoric acid | HF |  |  |
| Phosphoric acid | H3PO4 |  |  |