

# Solubility Products, Acid/Base Disassociation Constants

## Solubility Product Constants ( $K_{sp}$ )

Carbonates	Formula	$K_{sp}$	Phosphates	Formula	$K_{sp}$
Barium Carbonate	BaCO <sub>3</sub>	2.6x10 <sup>-9</sup>	Aluminum Phosphate	AlPO <sub>4</sub>	9.8x10 <sup>-21</sup>
Calcium Carbonate	CaCO <sub>3</sub>	3.4x10 <sup>-9</sup>	Calcium Phosphate	Ca <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>	2.1x10 <sup>-33</sup>
Copper (II) Carbonate	CuCO <sub>3</sub>	2.5x10 <sup>-10</sup>	Magnesium Phosphate	Mg <sub>3</sub> (PO <sub>4</sub> ) <sub>2</sub>	1.0x10 <sup>-24</sup>
Lead (II) Carbonate	PbCO <sub>3</sub>	7.4x10 <sup>-14</sup>	Hydroxides	Formula	$K_{sp}$
Magnesium Carbonate	MgCO <sub>3</sub>	6.8x10 <sup>-6</sup>	Aluminum Hydroxide	Al(OH) <sub>3</sub>	4.6x10 <sup>-33</sup>
Silver Carbonate	Ag <sub>2</sub> CO <sub>3</sub>	8.5x10 <sup>-12</sup>	Calcium Hydroxide	Ca(OH) <sub>2</sub>	5.0x10 <sup>-6</sup>
Zinc Carbonate	ZnCO <sub>3</sub>	1.5x10 <sup>-10</sup>	Copper (II) Hydroxide	Cu(OH) <sub>2</sub>	2.2x10 <sup>-20</sup>
Mercury (I) Carbonate	Hg <sub>2</sub> CO <sub>3</sub>	3.6x10 <sup>-17</sup>	Iron (II) Hydroxide	Fe(OH) <sub>2</sub>	4.9x10 <sup>-17</sup>
Chromates	Formula	$K_{sp}$	Iron (III) Hydroxide	Fe(OH) <sub>3</sub>	2.8x10 <sup>-39</sup>
Barium Chromate	BaCrO <sub>4</sub>	1.2x10 <sup>-10</sup>	Magnesium Hydroxide	Mg(OH) <sub>2</sub>	5.6x10 <sup>-12</sup>
Lead (II) Chromate	PbCrO <sub>4</sub>	2.3x10 <sup>-13</sup>	Zinc Hydroxide	Zn(OH) <sub>2</sub>	3.0x10 <sup>-17</sup>
Silver Chromate	Ag <sub>2</sub> CrO <sub>4</sub>	1.1x10 <sup>-12</sup>	Sulfates	Formula	$K_{sp}$
Halides	Formula	$K_{sp}$	Barium Sulfate	BaSO <sub>4</sub>	1.1x10 <sup>-10</sup>
Calcium Fluoride	CaF <sub>2</sub>	3.5x10 <sup>-11</sup>	Calcium Sulfate	CaSO <sub>4</sub>	4.9x10 <sup>-5</sup>
Lead (II) Bromide	PbBr <sub>2</sub>	6.6x10 <sup>-10</sup>	Lead (II) Sulfate	PbSO <sub>4</sub>	2.5x10 <sup>-8</sup>
Lead (II) Chloride	PbCl <sub>2</sub>	1.7x10 <sup>-5</sup>	Silver Sulfate	Ag <sub>2</sub> SO <sub>4</sub>	1.2x10 <sup>-5</sup>
Lead (II) Fluoride	PbF <sub>2</sub>	3.3x10 <sup>-8</sup>	Water	H <sub>2</sub> O	1.0x10 <sup>-14</sup>
Lead (II) Iodide	PbI <sub>2</sub>	9.8x10 <sup>-9</sup>			
Silver Chloride	AgCl	1.8x10 <sup>-10</sup>			
Silver Bromide	AgBr	5.4x10 <sup>-13</sup>			
Silver Iodide	AgI	8.5x10 <sup>-17</sup>			

## Strong Acids & Bases

Strong Acids	Formula	Strong Bases	Formula
Hydrochloric Acid	HCl	Sodium Hydroxide	NaOH
Hydrobromic Acid	HBr	Potassium Hydroxide	KOH
Hydroiodic Acid	HI	Rubidium Hydroxide	RbOH
Perchloric Acid	HClO <sub>4</sub>	Cesium Hydroxide	CsOH
Nitric Acid	HNO <sub>3</sub>	Calcium Hydroxide	Ca(OH) <sub>2</sub>
Sulfuric Acid	H <sub>2</sub> SO <sub>4</sub>	Strontium Hydroxide	Sr(OH) <sub>2</sub>
		Barium Hydroxide	Ba(OH) <sub>2</sub>

## Acid/Base/Buffer Constants

Acid Dissociation	Equation	$K_a$
Hydrosulfuric (1)	H <sub>2</sub> S <sub>(aq)</sub> ↔ H <sup>+</sup> <sub>(aq)</sub> + HS <sup>-</sup> <sub>(aq)</sub>	8.9x10 <sup>-8</sup>
Hydrosulfuric (2)	HS <sup>-</sup> <sub>(aq)</sub> ↔ H <sup>+</sup> <sub>(aq)</sub> + S <sup>-2</sup> <sub>(aq)</sub>	1.0x10 <sup>-19</sup>
Hydrofluoric	HF <sub>(aq)</sub> ↔ H <sup>+</sup> <sub>(aq)</sub> + F <sup>-</sup> <sub>(aq)</sub>	6.3x10 <sup>-4</sup>
Methanoic (Formic)	HCOOH <sub>(aq)</sub> ↔ H <sup>+</sup> <sub>(aq)</sub> + HCOO <sup>-</sup> <sub>(aq)</sub>	1.8x10 <sup>-4</sup>
Ethanoic (Acetic)	CH <sub>3</sub> COOH <sub>(aq)</sub> ↔ H <sup>+</sup> <sub>(aq)</sub> + CH <sub>3</sub> COO <sup>-</sup> <sub>(aq)</sub>	1.8x10 <sup>-5</sup>
Carbonic (1)	H <sub>2</sub> CO <sub>3(aq)</sub> ↔ H <sup>+</sup> <sub>(aq)</sub> + HCO <sub>3</sub> <sup>-</sup> <sub>(aq)</sub>	4.5x10 <sup>-7</sup>
Carbonic (2)	HCO <sub>3</sub> <sup>-</sup> <sub>(aq)</sub> ↔ H <sup>+</sup> <sub>(aq)</sub> + CO <sub>3</sub> <sup>-2</sup> <sub>(aq)</sub>	4.7x10 <sup>-11</sup>
Hypochlorous	HClO <sub>(aq)</sub> ↔ H <sup>+</sup> <sub>(aq)</sub> + ClO <sup>-</sup> <sub>(aq)</sub>	4.0x10 <sup>-8</sup>
Base Dissociation	Equation	$K_b$
Ethylamine	C <sub>2</sub> H <sub>5</sub> NH <sub>2(aq)</sub> + H <sub>2</sub> O <sub>(l)</sub> ↔ C <sub>2</sub> H <sub>5</sub> NH <sub>3</sub> <sup>+</sup> <sub>(aq)</sub> + OH <sup>-</sup> <sub>(aq)</sub>	5.0x10 <sup>-4</sup>
Methylamine	CH <sub>3</sub> NH <sub>2(aq)</sub> + H <sub>2</sub> O <sub>(l)</sub> ↔ CH <sub>3</sub> NH <sub>3</sub> <sup>+</sup> <sub>(aq)</sub> + OH <sup>-</sup> <sub>(aq)</sub>	4.3x10 <sup>-4</sup>
Ammonia	NH <sub>3(aq)</sub> + H <sub>2</sub> O <sub>(l)</sub> ↔ NH <sub>4</sub> <sup>+</sup> <sub>(aq)</sub> + OH <sup>-</sup> <sub>(aq)</sub>	2.5x10 <sup>-5</sup>
Aniline	C <sub>6</sub> H <sub>5</sub> NH <sub>2(aq)</sub> + H <sub>2</sub> O <sub>(l)</sub> ↔ C <sub>6</sub> H <sub>5</sub> NH <sub>3</sub> <sup>+</sup> <sub>(aq)</sub> + OH <sup>-</sup> <sub>(aq)</sub>	4.3x10 <sup>-7</sup>
Buffer Equilibrium	Conjugate A-B Pair	pH
HF <sub>(aq)</sub> ↔ H <sup>+</sup> <sub>(aq)</sub> + F <sup>-</sup> <sub>(aq)</sub>	HF/F <sup>-</sup>	3.20
CH <sub>3</sub> COOH <sub>(aq)</sub> ↔ H <sup>+</sup> <sub>(aq)</sub> + CH <sub>3</sub> COO <sup>-</sup> <sub>(aq)</sub>	CH <sub>3</sub> COOH/CH <sub>3</sub> COO <sup>-</sup>	4.76
H <sub>2</sub> CO <sub>3(aq)</sub> ↔ H <sup>+</sup> <sub>(aq)</sub> + HCO <sub>3</sub> <sup>-</sup> <sub>(aq)</sub>	H <sub>2</sub> CO <sub>3</sub> /HCO <sub>3</sub> <sup>-</sup>	6.35
H <sub>2</sub> PO <sub>4</sub> <sup>-</sup> <sub>(aq)</sub> ↔ H <sup>+</sup> <sub>(aq)</sub> + HPO <sub>4</sub> <sup>-2</sup> <sub>(aq)</sub>	H <sub>2</sub> PO <sub>4</sub> <sup>-</sup> /HPO <sub>4</sub> <sup>-2</sup>	7.21
NH <sub>3(aq)</sub> + H <sub>2</sub> O <sub>(l)</sub> ↔ NH <sub>4</sub> <sup>+</sup> <sub>(aq)</sub> + OH <sup>-</sup> <sub>(aq)</sub>	NH <sub>4</sub> <sup>+</sup> /NH <sub>3</sub>	9.40
C <sub>2</sub> H <sub>5</sub> NH <sub>2(aq)</sub> + H <sub>2</sub> O <sub>(l)</sub> ↔ C <sub>2</sub> H <sub>5</sub> NH <sub>3</sub> <sup>+</sup> <sub>(aq)</sub> + OH <sup>-</sup> <sub>(aq)</sub>	C <sub>2</sub> H <sub>5</sub> NH <sub>3</sub> <sup>+</sup> /C <sub>2</sub> H <sub>5</sub> NH <sub>2</sub>	10.70