

Formation Constants of Complex Ions

| Complex Ion Equilibrium | K _f |
|--|------------------------|
| Halide complexes | |
| [AlF ₆] ³⁻ | 7 × 10 ¹⁹ |
| [AlF ₄] ⁻¹ | 2.0 × 10 ⁸ |
| [BeF ₄] ²⁻ | 1.3 × 10 ¹³ |
| [SnF ₆] ²⁻ | 1 × 10 ²⁵ |
| [CuCl ₂] ⁻¹ | 3 × 10 ⁵ |
| [AgCl ₂] ⁻¹ | 1.8 × 10 ⁵ |
| [PbCl ₄] ²⁻ | 2.5 × 10 ¹⁵ |
| [ZnCl ₄] ²⁻ | 1.6 |
| [HgCl ₄] ²⁻ | 1.1 × 10 ¹⁶ |
| [CuBr ₂] ⁻¹ | 8.0 × 10 ⁵ |
| [AgBr ₂] ⁻¹ | 1 × 10 ¹¹ |
| [HgBr ₄] ²⁻ | 3 × 10 ⁴ |
| [CuI ₂] ⁻¹ | 8 × 10 ⁸ |
| [AgI ₂] ⁻¹ | 1 × 10 ¹¹ |
| [PbI ₄] ²⁻ | 3.0 × 10 ⁴ |
| [HgI ₄] ²⁻ | 2 × 10 ³⁰ |
| Ammonia complexes | |
| [Ag(NH ₃) ₂] ⁺ | 1.7 × 10 ⁷ |
| [Zn(NH ₃) ₄] ²⁺ | 2.8 × 10 ⁹ |
| [Cu(NH ₃) ₄] ²⁺ | 1.7 × 10 ¹³ |
| [Hg(NH ₃) ₄] ²⁺ | 1.8 × 10 ¹⁹ |
| [Co(NH ₃) ₆] ²⁺ | 1.3 × 10 ⁵ |
| [Co(NH ₃) ₆] ³⁺ | 2.3 × 10 ³³ |
| [Cd(NH ₃) ₆] ²⁺ | 2.6 × 10 ⁵ |
| [Ni(NH ₃) ₆] ²⁺ | 2.0 × 10 ⁸ |
| Cyanide complexes | |
| [Fe(CN) ₆] ⁴⁻ | 1.5 × 10 ³⁵ |
| [Fe(CN) ₆] ³⁻ | 2 × 10 ⁴³ |
| [Ag(CN) ₂] ⁻¹ | 1 × 10 ²¹ |
| [Cu(CN) ₂] ⁻¹ | 1.0 × 10 ¹⁶ |
| [Cd(CN) ₄] ²⁻ | 3 × 10 ¹⁸ |
| [Au(CN) ₂] ⁻¹ | 2 × 10 ³⁸ |
| [Ni(CN) ₄] ²⁻ | 2 × 10 ³¹ |
| Complexes with other monodentate ligands | |
| [Ag(CH ₃ NH ₂) ₂] ⁺¹ | 7.8 × 10 ⁶ |
| [Cd(SCN) ₄] ²⁻ | 1 × 10 ³ |
| [Cu(SCN) ₂] | 5.6 × 10 ³ |
| [Fe(SCN) ₃] | 2 × 10 ⁶ |
| [Hg(SCN) ₄] ²⁻ | 5.0 × 10 ²¹ |
| [Cu(OH) ₄] ²⁻ | 1.3 × 10 ¹⁶ |
| [Zn(OH) ₄] ²⁻ | 2 × 10 ¹⁵ |
| Complexes with bidentate ligands (en = ethylenediamine) | |
| [Mn(en) ₃] ²⁺ | 6.5 × 10 ⁵ |
| [Fe(en) ₃] ²⁺ | 5.0 × 10 ⁹ |
| [Co(en) ₃] ²⁺ | 8.7 × 10 ¹³ |
| [Co(en) ₃] ³⁺ | 4.9 × 10 ⁴⁸ |
| [Ni(en) ₃] ²⁺ | 2.1 × 10 ¹⁸ |
| [Cu(en) ₂] ²⁺ | 1 × 10 ²⁰ |
| [Co(C ₂ O ₄) ₃] ⁴⁻ | 5 × 10 ⁹ |
| [Fe(C ₂ O ₄) ₃] ³⁻ | 2 × 10 ²⁰ |

Acid Dissociation Constants (25°C)

| Name | Formula | K _{a1} | K _{a2} | K _{a3} |
|-------------------|---|-----------------------|-----------------------|-----------------------|
| Acetic | HC ₂ H ₃ O ₂ | 1.8×10 ⁻⁵ | | |
| Arsenic | H ₃ AsO ₄ | 5.5×10 ⁻³ | 1.7×10 ⁻⁷ | 5.1×10 ⁻¹² |
| Ascorbic | HC ₆ H ₇ O ₆ | 8.0×10 ⁻⁵ | 1.6×10 ⁻¹² | |
| Benzoic | HC ₇ H ₅ O ₂ | 6.5×10 ⁻⁵ | | |
| Boric | H ₃ BO ₃ | 5.4×10 ⁻¹⁰ | | |
| Carbonic | H ₂ CO ₃ | 4.3×10 ⁻⁷ | 5.6×10 ⁻¹¹ | |
| Citric | H ₃ C ₆ H ₅ O ₇ | 7.4×10 ⁻⁴ | 1.7×10 ⁻⁵ | 4.0×10 ⁻⁷ |
| Cyanic | HCNO | 2×10 ⁻⁴ | | |
| Formic | HCHO ₂ | 1.8×10 ⁻⁴ | | |
| Hydrocyanic | HCN | 4.9×10 ⁻¹⁰ | | |
| Hydrofluoric | HF | 3.5×10 ⁻⁴ | | |
| Hydrogen peroxide | H ₂ O ₂ | 2.4×10 ⁻¹² | | |
| Selenic | H ₂ SeO ₄ | Strong Acid | 2.2×10 ⁻² | |
| Hydrosulfuric | H ₂ S | 8.9×10 ⁻⁸ | 1×10 ⁻¹⁹ | |
| Iodic | HIO ₃ | 1.7×10 ⁻¹ | | |
| Lactic | HC ₃ H ₅ O ₃ | 1.4×10 ⁻⁴ | | |
| Malonic | H ₂ C ₃ H ₂ O ₄ | 1.5×10 ⁻³ | 2.0×10 ⁻⁶ | |
| Nitrous | HNO ₂ | 4.6×10 ⁻⁴ | | |
| Oxalic | H ₂ C ₂ O ₄ | 6.0×10 ⁻² | 6.1×10 ⁻⁵ | |
| Phenol | HC ₆ H ₅ O | 1.3×10 ⁻¹⁰ | | |
| Phosphoric | H ₃ PO ₄ | 7.5×10 ⁻³ | 6.2×10 ⁻⁸ | 4.2×10 ⁻¹³ |
| Propanoic | HC ₃ H ₅ O ₂ | 1.3×10 ⁻⁵ | | |
| Selenous | H ₂ SeO ₃ | 2.4×10 ⁻³ | 4.8×10 ⁻⁹ | |
| Sulfuric | H ₂ SO ₄ | Strong Acid | 1.2×10 ⁻² | |
| Sulfurous | H ₂ SO ₃ | 1.6×10 ⁻² | 6.4×10 ⁻⁸ | |

Base Dissociation Constants (25°C)

| Name | Formula | K _b | Name | Formula | K _b |
|----------------|---|-----------------------|---------------|--|----------------------|
| Ammonia | NH ₃ | 1.76×10 ⁻⁵ | Hydrazine | H ₂ NNH ₂ | 1.3×10 ⁻⁶ |
| Aniline | C ₆ H ₅ NH ₂ | 3.9×10 ⁻¹⁰ | Hydroxylamine | HONH ₂ | 1.1×10 ⁻⁸ |
| Dimethylamine | (CH ₃) ₂ NH | 6.9×10 ⁻⁴ | Methylamine | CH ₃ NH ₂ | 4.4×10 ⁻⁴ |
| Ethylamine | C ₂ H ₅ NH ₂ | 5.6×10 ⁻⁴ | Pyridine | C ₅ H ₅ N | 1.7×10 ⁻⁹ |
| Trimethylamine | (CH ₃) ₃ N | 6.4×10 ⁻⁵ | Diethylamine | (C ₂ H ₅) ₂ NH | 6.9×10 ⁻⁴ |