

# Standard Reduction Potentials

| <b>Ox + <math>ne^{1-}</math></b>                     | <b>Red</b>                                  | <b><math>\mathcal{E}^\circ</math> (V)</b> |
|------------------------------------------------------|---------------------------------------------|-------------------------------------------|
| $K^{1+}(aq) + e^{1-}$                                | $\rightleftharpoons K(s)$                   | -2.92                                     |
| $Na^{1+}(aq) + e^{1-}$                               | $\rightleftharpoons Na(s)$                  | -2.71                                     |
| $Mg^{2+}(aq) + 2 e^{1-}$                             | $\rightleftharpoons Mg(s)$                  | -2.36                                     |
| $Al^{3+}(aq) + 3 e^{1-}$                             | $\rightleftharpoons Al(s)$                  | -1.66                                     |
| $2 H_2O + 2 e^{1-}$                                  | $\rightleftharpoons H_2(g) + 2 OH^{1-}(aq)$ | -0.83                                     |
| $Zn^{2+}(aq) + 2 e^{1-}$                             | $\rightleftharpoons Zn(s)$                  | -0.76                                     |
| $Cr^{3+}(aq) + 3 e^{1-}$                             | $\rightleftharpoons Cr(s)$                  | -0.74                                     |
| $Fe^{2+}(aq) + 2 e^{1-}$                             | $\rightleftharpoons Fe(s)$                  | -0.44                                     |
| $2 H_2O + 2 e^{1-}$                                  | $\rightleftharpoons H_2(g) + 2 OH^{1-}(aq)$ | -0.41*                                    |
| $PbSO_4(s) + 2 e^{1-}$                               | $\rightleftharpoons Pb(s) + SO_4^{2-}(aq)$  | -0.36                                     |
| $Ni^{2+}(aq) + 2 e^{1-}$                             | $\rightleftharpoons Ni(s)$                  | -0.23                                     |
| $Sn^{2+}(aq) + 2 e^{1-}$                             | $\rightleftharpoons Sn(s)$                  | -0.14                                     |
| $Pb^{2+}(aq) + 2 e^{1-}$                             | $\rightleftharpoons Pb(s)$                  | -0.13                                     |
| $2 H^{1+}(aq) + 2 e^{1-}$                            | $\rightleftharpoons H_2(g)$                 | 0.00                                      |
| $Cu^{2+}(aq) + 2 e^{1-}$                             | $\rightleftharpoons Cu(s)$                  | +0.34                                     |
| $O_2(g) + 2 H_2O + 4 e^{1-}$                         | $\rightleftharpoons 4 OH^{1-}(aq)$          | +0.40                                     |
| $I_2(s) + 2 e^{1-}$                                  | $\rightleftharpoons 2 I^{1-}(aq)$           | +0.54                                     |
| $Fe^{3+}(aq) + e^{1-}$                               | $\rightleftharpoons Fe^{2+}(aq)$            | +0.77                                     |
| $Ag^{1+}(aq) + e^{1-}$                               | $\rightleftharpoons Ag(s)$                  | +0.80                                     |
| $O_2(g) + 4 H^{1+}(aq) + 4 e^{1-}$                   | $\rightleftharpoons 2 H_2O$                 | +0.82*                                    |
| $NO_3^{1-}(aq) + 4 H^{1+}(aq) + 3 e^{1-}$            | $\rightleftharpoons NO(g) + 2 H_2O$         | +0.96                                     |
| $Br_2(l) + 2 e^{1-}$                                 | $\rightleftharpoons 2 Br^{1-}(aq)$          | +1.09                                     |
| $O_2(g) + 4 H^{1+}(aq) + 4 e^{1-}$                   | $\rightleftharpoons 2 H_2O$                 | +1.23                                     |
| $Cr_2O_7^{2-}(aq) + 14 H^{1+}(aq) + 6 e^{1-}$        | $\rightleftharpoons 2 Cr^{3+}(aq) + 7 H_2O$ | +1.33                                     |
| $Cl_2(g) + 2 e^{1-}$                                 | $\rightleftharpoons 2 Cl^{1-}(aq)$          | +1.36                                     |
| $MnO_4^{1-}(aq) + 8 H^{1+}(aq) + 5 e^{1-}$           | $\rightleftharpoons Mn^{2+}(aq) + 4 H_2O$   | +1.51                                     |
| $PbO_2(s) + 4 H^{1+}(aq) + SO_4^{2-}(aq) + 2 e^{1-}$ | $\rightleftharpoons PbSO_4(s) + 2 H_2O$     | +1.69                                     |
| $F_2(g) + 2 e^{1-}$                                  | $\rightleftharpoons 2 F^{1-}(aq)$           | +2.87                                     |

## Standard Reduction Potentials at 25 °C in volts

\* The half-cell potentials for the  $O_2/H_2O$  and the  $H_2O/H_2$  systems are for pure water and are not for standard reduction potentials where  $[OH^{1-}]$  and  $[H^{1+}] = 1.0 M$ .