

STANDARD REDUCTION POTENTIALS IN AQUEOUS SOLUTION AT 25°C

Half-reaction			$E^\circ(\text{V})$
$\text{F}_2(\text{g}) + 2\text{e}^-$	\rightarrow	2F^-	2.87
$\text{Co}^{3+} + \text{e}^-$	\rightarrow	Co^{2+}	1.82
$\text{Au}^{3+} + 3\text{e}^-$	\rightarrow	$\text{Au}(\text{s})$	1.50
$\text{Cl}_2(\text{g}) + 2\text{e}^-$	\rightarrow	2Cl^-	1.36
$\text{O}_2(\text{g}) + 4\text{H}^+ + 4\text{e}^-$	\rightarrow	$2\text{H}_2\text{O}(\text{l})$	1.23
$\text{Br}_2(\text{l}) + 2\text{e}^-$	\rightarrow	2Br^-	1.07
$2\text{Hg}^{2+} + 2\text{e}^-$	\rightarrow	Hg_2^{2+}	0.92
$\text{Hg}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Hg}(\text{l})$	0.85
$\text{Ag}^+ + \text{e}^-$	\rightarrow	$\text{Ag}(\text{s})$	0.80
$\text{Hg}_2^{2+} + 2\text{e}^-$	\rightarrow	$2\text{Hg}(\text{l})$	0.79
$\text{Fe}^{3+} + \text{e}^-$	\rightarrow	Fe^{2+}	0.77
$\text{I}_2(\text{s}) + 2\text{e}^-$	\rightarrow	2I^-	0.53
$\text{Cu}^+ + \text{e}^-$	\rightarrow	$\text{Cu}(\text{s})$	0.52
$\text{Cu}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Cu}(\text{s})$	0.34
$\text{Cu}^{2+} + \text{e}^-$	\rightarrow	Cu^+	0.15
$\text{Sn}^{4+} + 2\text{e}^-$	\rightarrow	Sn^{2+}	0.15
$\text{S}(\text{s}) + 2\text{H}^+ + 2\text{e}^-$	\rightarrow	$\text{H}_2\text{S}(\text{g})$	0.14
$2\text{H}^+ + 2\text{e}^-$	\rightarrow	$\text{H}_2(\text{g})$	0.00
$\text{Pb}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Pb}(\text{s})$	-0.13
$\text{Sn}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Sn}(\text{s})$	-0.14
$\text{Ni}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Ni}(\text{s})$	-0.25
$\text{Co}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Co}(\text{s})$	-0.28
$\text{Cd}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Cd}(\text{s})$	-0.40
$\text{Cr}^{3+} + \text{e}^-$	\rightarrow	Cr^{2+}	-0.41
$\text{Fe}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Fe}(\text{s})$	-0.44
$\text{Cr}^{3+} + 3\text{e}^-$	\rightarrow	$\text{Cr}(\text{s})$	-0.74
$\text{Zn}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Zn}(\text{s})$	-0.76
$2\text{H}_2\text{O}(\text{l}) + 2\text{e}^-$	\rightarrow	$\text{H}_2(\text{g}) + 2\text{OH}^-$	-0.83
$\text{Mn}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Mn}(\text{s})$	-1.18
$\text{Al}^{3+} + 3\text{e}^-$	\rightarrow	$\text{Al}(\text{s})$	-1.66
$\text{Be}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Be}(\text{s})$	-1.70
$\text{Mg}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Mg}(\text{s})$	-2.37
$\text{Na}^+ + \text{e}^-$	\rightarrow	$\text{Na}(\text{s})$	-2.71
$\text{Ca}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Ca}(\text{s})$	-2.87
$\text{Sr}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Sr}(\text{s})$	-2.89
$\text{Ba}^{2+} + 2\text{e}^-$	\rightarrow	$\text{Ba}(\text{s})$	-2.90
$\text{Rb}^+ + \text{e}^-$	\rightarrow	$\text{Rb}(\text{s})$	-2.92
$\text{K}^+ + \text{e}^-$	\rightarrow	$\text{K}(\text{s})$	-2.92
$\text{Cs}^+ + \text{e}^-$	\rightarrow	$\text{Cs}(\text{s})$	-2.92
$\text{Li}^+ + \text{e}^-$	\rightarrow	$\text{Li}(\text{s})$	-3.05

Standard Reduction Potentials of Half-Cells

(Ionic concentrations are at 1M in water @ 25^o C)

Oxidizing Agents	Reducing Agents	E ^o (Volts)
$F_2(g) + 2e^- \rightarrow 2F^-(aq)$		+2.87
$PbO_2(s) + SO_4^{2-}(aq) + 4H^+(aq) + 2e^- \rightarrow PbSO_4(s) + 2H_2O(l)$		+1.69
$MnO_4^-(aq) + 8H^+(aq) + 5e^- \rightarrow Mn^{2+}(aq) + 4H_2O(l)$		+1.51
$Au^{3+}(aq) + 3e^- \rightarrow Au(s)$		+1.50
$ClO_4^-(aq) + 8H^+(aq) + 8e^- \rightarrow Cl^-(aq) + 4H_2O(l)$		+1.39
$Cl_2(g) + 2e^- \rightarrow 2Cl^-(aq)$		+1.36
$Cr_2O_7^{2-}(aq) + 14H^+(aq) + 6e^- \rightarrow 2Cr^{3+}(aq) + 7H_2O(l)$		+1.33
$2HNO_2(aq) + 4H^+(aq) + 4e^- \rightarrow N_2O(g) + 3H_2O(l)$		+1.30
$O_2(g) + 4H^+(aq) + 4e^- \rightarrow 2H_2O(l)$		+1.23
$MnO_2(s) + 4H^+(aq) + 2e^- \rightarrow Mn^{2+}(aq) + 2H_2O(l)$		+1.22
$Br_2(aq) + 2e^- \rightarrow 2Br^-(aq)$		+1.07
$Hg^{2+}(aq) + 2e^- \rightarrow Hg(l)$		+0.85
$ClO^-(aq) + H_2O(l) + 2e^- \rightarrow Cl^-(aq) + 2OH^-(aq)$		+0.84
$Ag^+(aq) + e^- \rightarrow Ag(s)$		+0.80
$NO_3^-(aq) + 2H^+(aq) + e^- \rightarrow NO_2(g) + H_2O(l)$		+0.80
$Fe^{3+}(aq) + e^- \rightarrow Fe^{2+}(aq)$		+0.77
$O_2(g) + 2H^+(aq) + 2e^- \rightarrow H_2O_2(l)$		+0.70
$I_2(s) + 2e^- \rightarrow 2I^-(aq)$		+0.54
$O_2(g) + 2H_2O(l) + 4e^- \rightarrow 4OH^-(aq)$		+0.40
$Cu^{2+}(aq) + 2e^- \rightarrow Cu(s)$		+0.34
$SO_4^{2-}(aq) + 4H^+(aq) + 2e^- \rightarrow H_2SO_3(aq) + H_2O(l)$		+0.17
$Sn^{4+}(aq) + 2e^- \rightarrow Sn^{2+}(aq)$		+0.15
$S(s) + 2H^+(aq) + 2e^- \rightarrow H_2S(aq)$		+0.14
$AgBr(s) + e^- \rightarrow Ag(s) + Br^-(aq)$		+0.07
$2H^+(aq) + 2e^- \rightarrow H_2(g)$		0.00
$Pb^{2+}(aq) + 2e^- \rightarrow Pb(s)$		-0.13
$Sn^{2+}(aq) + 2e^- \rightarrow Sn(s)$		-0.14
$AgI(s) + e^- \rightarrow Ag(s) + I^-(aq)$		-0.15
$Ni^{2+}(aq) + 2e^- \rightarrow Ni(s)$		-0.26
$Co^{2+}(aq) + 2e^- \rightarrow Co(s)$		-0.28
$PbSO_4(s) + 2e^- \rightarrow Pb(s) + SO_4^{2-}(aq)$		-0.36
$Se(s) + 2H^+(aq) + 2e^- \rightarrow H_2Se(aq)$		-0.40
$Cd^{2+}(aq) + 2e^- \rightarrow Cd(s)$		-0.40
$Cr^{3+}(aq) + e^- \rightarrow Cr^{2+}(aq)$		-0.41
$Fe^{2+}(aq) + 2e^- \rightarrow Fe(s)$		-0.45
$NO_2^-(aq) + H_2O(l) + e^- \rightarrow NO(g) + 2OH^-(aq)$		-0.46
$Ag_2S(s) + 2e^- \rightarrow 2Ag(s) + S^{2-}(aq)$		-0.69
$Zn^{2+}(aq) + 2e^- \rightarrow Zn(s)$		-0.76
$2H_2O(l) + 2e^- \rightarrow H_2(g) + 2OH^-(aq)$		-0.83
$Cr^{2+}(aq) + 2e^- \rightarrow Cr(s)$		-0.91
$Se(s) + 2e^- \rightarrow Se^{2-}(aq)$		-0.92
$SO_4^{2-}(aq) + H_2O(l) + 2e^- \rightarrow SO_3^{2-}(aq) + 2OH^-(aq)$		-0.93
$Al^{3+}(aq) + 3e^- \rightarrow Al(s)$		-1.66
$Mg^{2+}(aq) + 2e^- \rightarrow Mg(s)$		-2.37
$Na^+(aq) + e^- \rightarrow Na(s)$		-2.71
$Ca^{2+}(aq) + 2e^- \rightarrow Ca(s)$		-2.87
$Ba^{2+}(aq) + 2e^- \rightarrow Ba(s)$		-2.91
$Li^+(aq) + e^- \rightarrow Li(s)$		-3.04

Increasing Strength of Oxidizing Agents

Increasing Strength of Reducing Agents