

Standard Reduction Potentials in Aqueous Solution at 25°C

Acidic Solution	Std Red Pot, E ⁰ (volts)	Acidic Solution	Std Red Pot, E ⁰ (volts)
Li ⁺ (aq) + e ⁻ → Li(s)	-3.045	Hg ₂ Cl ₂ (s) + 2e ⁻ → 2Hg(l) + 2Cl ⁻ (aq)	0.270
K ⁺ (aq) + e ⁻ → K(s)	-2.925	Cu ²⁺ (aq) + 2e ⁻ → Cu(s)	0.337
Rb ⁺ (aq) + e ⁻ → Rb(s)	-2.925	[RhCl ₆] ³⁻ (aq) + 3e ⁻ → Rh(s) + 6Cl ⁻ (aq)	0.440
Ba ²⁺ (aq) + 2e ⁻ → Ba(s)	-2.900	Cu ⁺ (aq) + e ⁻ → Cu(s)	0.521
Sr ²⁺ (aq) + 2e ⁻ → Sr(s)	-2.890	TeO ₂ (s) + 4H ⁺ (aq) + 4e ⁻ → Te(s) + H ₂ O	0.529
Ca ²⁺ (aq) + 2e ⁻ → Ca(s)	-2.870	I ₂ (s) + 2e ⁻ → 2I ⁻ (aq)	0.535
Na ⁺ (aq) + e ⁻ → Na(s)	-2.714	H ₃ AsO ₄ (aq) + 2H ⁺ (aq) + 2e ⁻ → H ₃ AsO ₃ (aq) + H ₂ O	0.580
Mg ²⁺ (aq) + 2e ⁻ → Mg(s)	-2.370	[PtCl ₆] ²⁻ (aq) + 2e ⁻ → [PtCl ₄] ²⁻ (aq) + 2Cl ⁻ (aq)	0.680
H ₂ (g) + 2e ⁻ → 2H ⁻ (aq)	-2.250	O ₂ (g) + 2H ⁺ (aq) + 2e ⁻ → H ₂ O ₂ (aq)	0.682
Al ³⁺ (aq) + 3e ⁻ → Al(s)	-1.660	[PtCl ₄] ²⁻ (aq) + 2e ⁻ → Pt(s) + 4Cl ⁻ (aq)	0.730
Zr ⁴⁺ (aq) + 4e ⁻ → Zr(s)	-1.530	SbCl ₆ ⁻ (aq) + 2e ⁻ → SbCl ₄ ⁻ (aq) + 2Cl ⁻ (aq)	0.750
ZnS(s) + 2e ⁻ → Zn(s) + S ²⁻ (aq)	-1.440	Fe ³⁺ (aq) + e ⁻ → Fe ²⁺ (aq)	0.771
CdS(s) + 2e ⁻ → Cd(s) + S ²⁻ (aq)	-1.210	Hg ₂ ²⁺ (aq) + 2e ⁻ → 2Hg(l)	0.789
V ²⁺ (aq) + 2e ⁻ → V(s)	-1.180	Ag ⁺ (aq) + e ⁻ → Ag(s)	0.7994
Mn ²⁺ (aq) + 2e ⁻ → Mn(s)	-1.180	Hg ²⁺ (aq) + 2e ⁻ → Hg(l)	0.855
FeS(s) + 2e ⁻ → Fe(s) + S ²⁻ (aq)	-1.010	2Hg ²⁺ (aq) + 2e ⁻ → Hg ₂ ²⁺ (aq)	0.920
Cr ²⁺ (aq) + 2e ⁻ → Cr(s)	-0.910	NO ₃ ⁻ (aq) + 3H ⁺ (aq) + 2e ⁻ → HNO ₂ (aq) + H ₂ O	0.940
Zn ²⁺ (aq) + 2e ⁻ → Zn(s)	-0.763	NO ₃ ⁻ (aq) + 4H ⁺ (aq) + 3e ⁻ → NO(g) + 2H ₂ O(l)	0.960
Cr ³⁺ (aq) + 3e ⁻ → Cr(s)	-0.740	Pd ²⁺ (aq) + 2e ⁻ → Pd(s)	0.987
HgS(s) + 2H ⁺ (aq) + 2e ⁻ → Hg(l) + H ₂ S(g)	-0.720	AuCl ₄ ⁻ (aq) + 3e ⁻ → Au(s) + 4Cl ⁻ (aq)	1.000
Ga ³⁺ (aq) + 3e ⁻ → Ga(s)	-0.530	Br ₂ (l) + 2e ⁻ → 2Br ⁻ (aq)	1.080
2CO ₂ (g) + 2H ⁺ (aq) + 2e ⁻ → (COOH) ₂ (aq)	-0.490	ClO ₄ ⁻ (aq) + 2H ⁺ (aq) + 2e ⁻ → ClO ₃ ⁻ (aq) + H ₂ O	1.190
Fe ²⁺ (aq) + 2e ⁻ → Fe(s)	-0.440	IO ₃ ⁻ (aq) + 6H ⁺ (aq) + 5e ⁻ → ½ I ₂ (aq) + 3H ₂ O	1.195
Cr ³⁺ (aq) + e ⁻ → Cr ²⁺ (s)	-0.410	Pt ²⁺ (aq) + 2e ⁻ → Pt(s)	1.200
Cd ²⁺ (aq) + 2e ⁻ → Cd(s)	-0.403	O ₂ (g) + 4H ⁺ (aq) + 4e ⁻ → 2H ₂ O	1.229
Se(s) + 2H ⁺ (aq) + 2e ⁻ → H ₂ Se(aq)	-0.400	MnO ₂ (s) + 4H ⁺ (aq) + 2e ⁻ → Mn ²⁺ (aq) + 2H ₂ O	1.230
PbSO ₄ (s) + 2e ⁻ → Pb(s) + SO ₄ ²⁻ (aq)	-0.356	N ₂ H ₅ ⁺ (aq) + 3H ⁺ (aq) + 2e ⁻ → 2NH ₄ ⁺ (aq)	1.240
Tl ⁺ (aq) + e ⁻ → Tl(s)	-0.340	Cr ₂ O ₇ ²⁻ (aq) + 14H ⁺ (aq) + 6e ⁻ → 2Cr ³⁺ (aq) + 7H ₂ O	1.330
Co ²⁺ (aq) + 2e ⁻ → Co(s)	-0.280	Cl ₂ (g) + 2e ⁻ → 2Cl ⁻ (aq)	1.360
Ni ²⁺ (aq) + 2e ⁻ → Ni(s)	-0.250	BrO ₃ ⁻ (aq) + 6H ⁺ (aq) + 6e ⁻ → Br ⁻ (aq) + 3H ₂ O	1.440
[SnF ₆] ²⁻ (aq) + 4e ⁻ → Sn(s) + 6F ⁻ (aq)	-0.250	ClO ₃ ⁻ (aq) + 6H ⁺ (aq) + 5e ⁻ → ½ Cl ₂ (g) + 3H ₂ O	1.470
AgI(s) + e ⁻ → Ag(s) + I ⁻ (aq)	-0.150	Au ³⁺ (aq) + 3e ⁻ → Au(s)	1.500
Sn ²⁺ (aq) + 2e ⁻ → Sn(s)	-0.140	MnO ₄ ⁻ (aq) + 8H ⁺ (aq) + 5e ⁻ → Mn ²⁺ (aq) + 4H ₂ O	1.507
Pb ²⁺ (aq) + 2e ⁻ → Pb(s)	-0.126	NaBiO ₃ (s) + 6H ⁺ (aq) + 2e ⁻ → Bi ³⁺ (aq) + Na ⁺ (aq) + 3H ₂ O	1.600
N ₂ O(g) + 6H ⁺ (aq) + H ₂ O + 4e ⁻ → 2NH ₃ OH ⁺ (aq)	-0.050	Ce ⁴⁺ (aq) + e ⁻ → Ce ³⁺ (aq)	1.610
2H ⁺ (aq) + 2e ⁻ → H ₂ (g) (reference electrode)	0.000	2HOCl(aq) + 2H ⁺ (aq) + 2e ⁻ → Cl ₂ (g) + 2H ₂ O	1.630
AgBr(s) + e ⁻ → Ag(s) + Br ⁻ (aq)	0.100	Au ⁺ (aq) + e ⁻ → Au(s)	1.680
S(s) + 2H ⁺ (aq) + 2e ⁻ → H ₂ S(aq)	0.140	PbO ₂ (s) + SO ₄ ²⁻ (aq) + 4H ⁺ (aq) + 2e ⁻ → PbSO ₄ (s) + 2H ₂ O	1.685
Sn ⁴⁺ (aq) + 2e ⁻ → Sn ²⁺ (aq)	0.150	NiO ₂ (s) + 4H ⁺ (aq) + 2e ⁻ → Ni ²⁺ (aq) + 2H ₂ O	1.700
Cu ²⁺ (aq) + e ⁻ → Cu ⁺ (aq)	0.153	H ₂ O ₂ (aq) + 2H ⁺ (aq) + 2e ⁻ → 2H ₂ O	1.770
SO ₄ ²⁻ (aq) + 4H ⁺ (aq) + 2e ⁻ → H ₂ SO ₃ (aq) + H ₂ O	0.170	Pb ⁴⁺ (aq) + 2e ⁻ → Pb ²⁺ (aq)	1.800
SO ₄ ²⁻ (aq) + 4H ⁺ (aq) + 2e ⁻ → SO ₂ (g) + 2H ₂ O	0.200	Co ³⁺ (aq) + e ⁻ → Co ²⁺ (aq)	1.820
AgCl(s) + e ⁻ → Ag(s) + Cl ⁻ (aq)	0.222	F ₂ (g) + 2e ⁻ → 2F ⁻ (aq)	2.870

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Basic Solution	Std Red Pot, E ⁰ (volts)
$\text{SiO}_3^{2-}(\text{aq}) + 3\text{H}_2\text{O} + 4\text{e}^- \rightarrow \text{Si}(\text{s}) + 6\text{OH}^-(\text{aq})$	-1.700
$\text{Cr}(\text{OH})_3(\text{s}) + 3\text{e}^- \rightarrow \text{Cr}(\text{s}) + 3\text{OH}^-(\text{aq})$	-1.300
$[\text{Zn}(\text{CN})_4]^{2-}(\text{aq}) + 2\text{e}^- \rightarrow \text{Zn}(\text{s}) + 4\text{CN}^-(\text{aq})$	-1.260
$\text{Zn}(\text{OH})_2(\text{s}) + 2\text{e}^- \rightarrow \text{Zn}(\text{s}) + 2\text{OH}^-(\text{aq})$	-1.245
$[\text{Zn}(\text{OH})_4]^{2-}(\text{aq}) + 2\text{e}^- \rightarrow \text{Zn}(\text{s}) + 4\text{OH}^-(\text{aq})$	-1.220
$\text{N}_2(\text{g}) + 4\text{H}_2\text{O} + 4\text{e}^- \rightarrow \text{N}_2\text{H}_4(\text{aq}) + 4\text{OH}^-(\text{aq})$	-1.150
$\text{SO}_4^{2-}(\text{aq}) + \text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{SO}_3^{2-}(\text{aq}) + 2\text{OH}^-(\text{aq})$	-0.930
$\text{Fe}(\text{OH})_2(\text{s}) + 2\text{e}^- \rightarrow \text{Fe}(\text{s}) + 2\text{OH}^-(\text{aq})$	-0.877
$2\text{NO}_3^-(\text{aq}) + 2\text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{N}_2\text{O}_4(\text{g}) + 4\text{OH}^-(\text{aq})$	-0.850
$2\text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{H}_2(\text{g}) + 2\text{OH}^-(\text{aq})$	-0.828
$\text{Fe}(\text{OH})_3(\text{s}) + \text{e}^- \rightarrow \text{Fe}(\text{OH})_2(\text{s}) + \text{OH}^-(\text{aq})$	-0.560
$\text{S}(\text{s}) + 2\text{e}^- \rightarrow \text{S}^{2-}(\text{aq})$	-0.480
$\text{Cu}(\text{OH})_2(\text{s}) + 2\text{e}^- \rightarrow \text{Cu}(\text{s}) + 2\text{OH}^-(\text{aq})$	-0.360
$\text{CrO}_4^{2-}(\text{aq}) + 4\text{H}_2\text{O} + 3\text{e}^- \rightarrow \text{Cr}(\text{OH})_3(\text{s}) + 5\text{OH}^-(\text{aq})$	-0.120
$\text{MnO}_2(\text{s}) + 2\text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{Mn}(\text{OH})_2(\text{s}) + 2\text{OH}^-(\text{aq})$	-0.050
$\text{NO}_3^-(\text{aq}) + \text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{NO}_2^-(\text{aq}) + 2\text{OH}^-(\text{aq})$	0.010
$\text{O}_2(\text{g}) + \text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{OOH}^-(\text{aq}) + \text{OH}^-(\text{aq})$	0.076
$\text{HgO}(\text{s}) + \text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{Hg}(\text{l}) + 2\text{OH}^-(\text{aq})$	0.0984
$[\text{Co}(\text{NH}_3)_6]^{3+}(\text{aq}) + \text{e}^- \rightarrow [\text{Co}(\text{NH}_3)_6]^{2+}(\text{aq})$	0.100
$\text{N}_2\text{H}_4(\text{aq}) + 2\text{H}_2\text{O} + 2\text{e}^- \rightarrow 2\text{NH}_3(\text{aq}) + 2\text{OH}^-(\text{aq})$	0.100
$2\text{NO}_2^-(\text{aq}) + 3\text{H}_2\text{O} + 4\text{e}^- \rightarrow 2\text{N}_2\text{O}(\text{g}) + 6\text{OH}^-(\text{aq})$	0.150
$\text{Ag}_2\text{O}(\text{s}) + \text{H}_2\text{O} + 2\text{e}^- \rightarrow 2\text{Ag}(\text{s}) + 2\text{OH}^-(\text{aq})$	0.340
$\text{ClO}_4^-(\text{aq}) + \text{H}_2\text{O}(\text{l}) + 2\text{e}^- \rightarrow \text{ClO}_3^-(\text{aq}) + 2\text{OH}^-(\text{aq})$	0.360
$\text{O}_2(\text{g}) + 2\text{H}_2\text{O} + 4\text{e}^- \rightarrow 4\text{OH}^-(\text{aq})$	0.400
$\text{Ag}_2\text{CrO}_4(\text{s}) + 2\text{e}^- \rightarrow 2\text{Ag}(\text{s}) + 2\text{CrO}_4^{2-}(\text{aq})$	0.446
$\text{NiO}_2(\text{s}) + 2\text{H}_2\text{O} + 2\text{e}^- \rightarrow \text{Ni}(\text{OH})_2(\text{s}) + 2\text{OH}^-(\text{aq})$	0.490
$\text{MnO}_4^-(\text{aq}) + \text{e}^- \rightarrow \text{MnO}_4^{2-}(\text{aq})$	0.564
$\text{MnO}_4^-(\text{aq}) + 2\text{H}_2\text{O} + 3\text{e}^- \rightarrow \text{MnO}_2(\text{s}) + 4\text{OH}^-(\text{aq})$	0.588
$\text{ClO}_3^-(\text{aq}) + 3\text{H}_2\text{O}(\text{l}) + 6\text{e}^- \rightarrow \text{Cl}^-(\text{aq}) + 6\text{OH}^-(\text{aq})$	0.620
$2\text{NH}_2\text{OH}(\text{aq}) + 2\text{e}^- \rightarrow \text{N}_2\text{H}_4(\text{aq}) + 2\text{OH}^-(\text{aq})$	0.740
$\text{OOH}^-(\text{aq}) + \text{H}_2\text{O} + 2\text{e}^- \rightarrow 3\text{OH}^-(\text{aq})$	0.880
$\text{ClO}^-(\text{aq}) + \text{H}_2\text{O}(\text{l}) + 2\text{e}^- \rightarrow \text{Cl}^-(\text{aq}) + 2\text{OH}^-(\text{aq})$	0.890