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Equilibrium constants for hydrolysis and associated equilibria in critical compilations

Nickel(II)

Equilibrium reactions	lg*K* at infinite dilution and *T* = 298 K					
	Feitknecht and Schindler, 1963	Baes and Mesmer, 1976	NIST46	Gamsjäger et al., 2005	Thoenen et al., 2014	Brown and Ekberg, 2016
$Ni^{2+} + H_2O \rightleftharpoons NiOH^+ + H^+$		–9.86	–9.9	–9.54 ± 0.14	–9.54 ± 0.14	–9.90 ± 0.03
$Ni^{2+} + 2\ H_2O \rightleftharpoons Ni(OH)_2 + 2\ H^+$		–19	–19		< –18	–21.15 ± 0.06
$Ni^{2+} + 3\ H_2O \rightleftharpoons Ni(OH)_3^- + 3\ H^+$		–30	–30	–29.2 ± 1.7	–29.2 ± 1.7	
$Ni^{2+} + 4\ H_2O \rightleftharpoons Ni(OH)_4^{2-} + 4\ H^+$		< –44				
$2\ Ni^{2+} + H_2O \rightleftharpoons Ni_2(OH)^{3+} + H^+$		–10.7		–10.6 ± 1.0	–10.6 ± 1.0	–10.6 ± 1.0
$4\ Ni^{2+} + 4\ H_2O \rightleftharpoons Ni_4(OH)_4^{4+} + 4\ H^+$		–27.74	–27.7	–27.52 ± 0.15	–27.52 ± 0.15	–27.9 ± 0.6

β-$Ni(OH)_2(s) + 2\ H^+ \rightleftharpoons Ni^{2+} + 2\ H_2O$		10.8			11.02 ± 0.20	10.96 ± 0.20 11.75 ± 0.13 (microcr)
$Ni(OH)_2(s) \rightleftharpoons Ni^{2+} + 2\ OH^-$	–17.2 (inactive)		–17.2	–16.97± 0.20 (β) –17.2 ± 1.3 (cr)		
$Ni(OH)_2(s) + OH^- \rightleftharpoons Ni(OH)_3^-$	–4.2 (inactive)					
$NiO(cr) + 2\ H^+ \rightleftharpoons Ni^{2+} + H_2O$				12.38 ± 0.06		12.48 ± 0.15

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Distribution diagrams

These diagrams have been computed at two Ni(II)i concentrations (1 mM = $1x10^{-3}$ mol L^{-1} and 1 µM = $1x10^{-6}$ mol L^{-1}) with the 'best' equilibrium constants above (in green). Calculations assume T = 298 K for the limiting case of zero ionic strength (*i.e.*, even neglecting plotted ions).