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Equilibrium constants for hydrolysis and associated equilibria in critical compilations

Ytterbium

Equilibrium reactions	lg*K* at infinite dilution and *T* = 298 K	
	Baes and Mesmer, 1976	Brown and Ekberg, 2016
$Yb^{3+} + H_2O \rightleftharpoons YbOH^{2+} + H^+$	−7.7	−7.31 ± 0.18
$Yb^{3+} + 2\ H_2O \rightleftharpoons Yb(OH)_2^{+} + 2\ H^+$	(−15.8)	
$Yb^{3+} + 3\ H_2O \rightleftharpoons Yb(OH)_3 + 3\ H^+$	(−24.1)	
$Yb^{3+} + 4\ H_2O \rightleftharpoons Yb(OH)_4^{-} + 4\ H^+$	−32.7	
$2\ Yb^{3+} + 2\ H_2O \rightleftharpoons Yb_2(OH)_2^{4+} + 2\ H^+$		−13.76 ± 0.20
$3\ Yb^{3+} + 5\ H_2O \rightleftharpoons Yb_3(OH)_5^{4+} + 5\ H^+$		−30.6 ± 0.3
$Yb(OH)_3(s) + 3\ H^+ \rightleftharpoons Yb^{3+} + 3\ H_2O$	14.7	15.35 ± 0.20

C.F. Baes and R.E. Mesmer, The Hydrolysis of Cations. Wiley, New York, 1976, p. 137.

P.L. Brown and C. Ekberg, Hydrolysis of Metal Ions. Wiley, 2016, pp. 247, 250−251 and 300−303.

Distribution diagrams

These diagrams have been computed at two Yb 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).