Author: montserrat.filella@unige.ch
Last update: 03/12/2024
Source: Compilation COST Action 1802

Equilibrium constants for hydrolysis and associated equilibria in critical compilations

Samarium

Equilibrium reactions	lg*K* at infinite dilution and *T* = 298 K		
	Baes and Mesmer, 1976	NIST46	Brown and Ekberg, 2016
$Sm^{3+} + H_2O \rightleftharpoons SmOH^{2+} + H^+$	–7.9	–7.9	–7.84 ± 0.11
$2\ Sm^{3+} + 2\ H_2O \rightleftharpoons Sm_2(OH)_2^{4+} + 2\ H^+$			–14.75 ± 0.20
$3\ Sm^{3+} + 5\ H_2O \rightleftharpoons Sm_3(OH)_5^{4+} + 5\ H^+$			–33.9 ± 0.3
$Sm(OH)_3(s) + 3H^+ \rightleftharpoons Sm^{3+} + 3H_2O$	16.5		17.19 ± 0.30
$Sm(OH)_3(s) \rightleftharpoons Sm^{3+} + 3\ OH^-$		–23.9 ± 0.9 (am) –25.9 (cr)	

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. 135–145.

NIST46, NIST Critically Selected Stability Constants of Metal Complexes: Version 8.0. Available at: www.nist.gov/srd/nist46

Distribution diagrams

These diagrams have been computed at two Sm 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).