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

Lanthanum

Equilibrium reaction	lg*K* at infinite dilution and *T* = 298 K	
	Baes and Mesmer, 1976	Brown and Ekberg, 2016
$La^{3+} + H_2O \rightleftharpoons LaOH^{2+} + H^+$	–8.5	–8.89 ± 0.10
$2\ La^{3+} + 2\ H_2O \rightleftharpoons La_2(OH)_2^{4+} + 2\ H^+$	≤ –17.5	–17.57 ± 0.20
$3\ La^{3+} + 5\ H_2O \rightleftharpoons La_3(OH)_5^{4+} + 5\ H^+$	≤ –38.3	–37.8 ± 0.3
$5\ La^{3+} + 9\ H_2O \rightleftharpoons La_5(OH)_9^{6+} + 9\ H^+$	–71.2	
$La(OH)_3(s) + 3\ H^+ \rightleftharpoons La^{3+} + 3\ H_2O$	20.3	19.72 ± 0.34

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.

Distribution diagrams

These diagrams have been computed at two La 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).