

Equilibrium constants for hydrolysis and associated equilibria in critical compilations

Lanthanum

Equilibrium reaction	lgK at infinite dilution and $T = 298 \text{ K}$	
	Baes and Mesmer, 1976	Brown and Ekberg, 2016
$\text{La}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{LaOH}^{2+} + \text{H}^+$	-8.5	-8.89 ± 0.10
$2 \text{La}^{3+} + 2 \text{H}_2\text{O} \rightleftharpoons \text{La}_2(\text{OH})_2^{4+} + 2 \text{H}^+$	≤ -17.5	-17.57 ± 0.20
$3 \text{La}^{3+} + 5 \text{H}_2\text{O} \rightleftharpoons \text{La}_3(\text{OH})_5^{4+} + 5 \text{H}^+$	≤ -38.3	-37.8 ± 0.3
$5 \text{La}^{3+} + 9 \text{H}_2\text{O} \rightleftharpoons \text{La}_5(\text{OH})_9^{6+} + 9 \text{H}^+$	-71.2	
$\text{La}(\text{OH})_3(\text{s}) + 3 \text{H}^+ \rightleftharpoons \text{La}^{3+} + 3 \text{H}_2\text{O}$	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 = 1×10^{-3} mol L⁻¹ and 1 μ M = 1×10^{-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).

