
Equilibrium constants for hydrolysis and associated equilibria in critical compilations

Cerium(III)

Equilibrium reactions	lgK at infinite dilution and $T = 298\text{ K}$		
	Baes and Mesmer, 1976	NIST46	Brown and Ekberg, 2016
$\text{Ce}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{CeOH}^{2+} + \text{H}^+$	-8.3	-8.3	-8.31 ± 0.03
$2 \text{Ce}^{3+} + 2 \text{H}_2\text{O} \rightleftharpoons \text{Ce}_2(\text{OH})_2^{4+} + 2 \text{H}^+$	< -15.5		-16.0 ± 0.2
$3 \text{Ce}^{3+} + 5 \text{H}_2\text{O} \rightleftharpoons \text{Ce}_3(\text{OH})_5^{4+} + 5 \text{H}^+$	-33.5		-34.6 ± 0.3
$\text{Ce}(\text{OH})_3(\text{s}) + 3 \text{H}^+ \rightleftharpoons \text{Ce}^{3+} + 3 \text{H}_2\text{O}$	19.9		18.5 ± 0.5
$\text{Ce}(\text{OH})_3(\text{s}) \rightleftharpoons \text{Ce}^{3+} + 3 \text{OH}^-$		-22.1 ± 0.9	

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 Ce(III) concentrations ($1 \text{ mM} = 1 \times 10^{-3} \text{ mol L}^{-1}$ and $1 \text{ }\mu\text{M} = 1 \times 10^{-6} \text{ mol L}^{-1}$) with the 'best' equilibrium constants above (in green). Calculations assume $T = 298 \text{ K}$ for the limiting case of zero ionic strength (*i.e.*, even neglecting plotted ions).

