

## Equilibrium constants for hydrolysis and associated equilibria in critical compilations

# Erbium

Equilibrium reactions	lgK at infinite dilution and $T = 298 \text{ K}$	
	Baes and Mesmer, 1976	Brown and Ekberg, 2016
$\text{Er}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{ErOH}^{2+} + \text{H}^+$	-7.9	$-7.46 \pm 0.09$
$\text{Er}^{3+} + 2 \text{H}_2\text{O} \rightleftharpoons \text{Er}(\text{OH})_2^+ + 2 \text{H}^+$	(-15.9)	
$\text{Er}^{3+} + 3 \text{H}_2\text{O} \rightleftharpoons \text{Er}(\text{OH})_3 + 3 \text{H}^+$	(-24.2)	
$\text{Er}^{3+} + 4 \text{H}_2\text{O} \rightleftharpoons \text{Er}(\text{OH})_4^- + 4 \text{H}^+$	-32.6	
$2 \text{Er}^{3+} + 2 \text{H}_2\text{O} \rightleftharpoons \text{Er}_2(\text{OH})_2^{4+} + 2 \text{H}^+$	-13.65	$-13.50 \pm 0.20$
$3 \text{Er}^{3+} + 5 \text{H}_2\text{O} \rightleftharpoons \text{Er}_3(\text{OH})_5^{4+} + 5 \text{H}^+$	<-29.3	$-31.0 \pm 0.3$
$\text{Er}(\text{OH})_3(\text{s}) + 3 \text{H}^+ \rightleftharpoons \text{Er}^{3+} + 3 \text{H}_2\text{O}$	15.0	$15.79 \pm 0.30$
$\text{Er}(\text{OH})_3(\text{c}) + \text{OH}^- \rightleftharpoons \text{Er}(\text{OH})_4^-$	-3.6	
$\text{Er}(\text{OH})_3(\text{c}) \rightleftharpoons \text{Er}(\text{OH})_3$	$\sim -9.2$	

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 295–297.

# Distribution diagrams

These diagrams have been computed at two Er concentrations (1 mM =  $1 \times 10^{-3}$  mol L<sup>-1</sup> and 1  $\mu$ M =  $1 \times 10^{-6}$  mol L<sup>-1</sup>) 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).

