

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

# Gallium

Equilibrium reactions	lgK at infinite dilution and $T = 298 \text{ K}$		
	Baes and Mesmer, 1976	NIST46	Brown and Ekberg, 2016
$\text{Ga}^{3+} + \text{H}_2\text{O} \rightleftharpoons \text{GaOH}^{2+} + \text{H}^+$	-2.6	-2.897	-2.74
$\text{Ga}^{3+} + 2 \text{H}_2\text{O} \rightleftharpoons \text{Ga}(\text{OH})_2^+ + 2 \text{H}^+$	-5.9	-6.694	-7.0
$\text{Ga}^{3+} + 3 \text{H}_2\text{O} \rightleftharpoons \text{Ga}(\text{OH})_3 + 3 \text{H}^+$	-10.3		-11.96
$\text{Ga}^{3+} + 4 \text{H}_2\text{O} \rightleftharpoons \text{Ga}(\text{OH})_4^- + 4 \text{H}^+$	-16.6	-16.588	-15.52
$\text{Ga}(\text{OH})_3(\text{s}) \rightleftharpoons \text{Ga}^{3+} + 3 \text{OH}^-$	$\approx -37$	-37.0	
$\text{GaO}(\text{OH})(\text{s}) + \text{H}_2\text{O} \rightleftharpoons \text{Ga}^{3+} + 3 \text{OH}^-$	-39.06	-39.1	-40.51

C.F. Baes and R.E. Mesmer, *The Hydrolysis of Cations*. Wiley, New York, 1976, p.319.

P.L. Brown and C. Ekberg, *Hydrolysis of Metal Ions*. Wiley, 2016, pp. 797–812.

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

# Distribution diagrams

These diagrams have been computed at two Ga 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 constant above (in green). Calculations assume  $T = 298 \text{ K}$  for the limiting case of zero ionic strength (*i.e.*, even neglecting plotted ions).

