
Equilibrium constants for hydrolysis and associated equilibria in critical compilations

Arsenic(III)

Equilibrium reaction	lgK at infinite dilution and $T = 298\text{ K}$		
	Baes and Mesmer, 1976	Nordstrom and Archer, 2003	Nordstrom et al., 2014
$\text{As(OH)}_4^- + \text{H}^+ \rightleftharpoons \text{As(OH)}_3 + \text{H}_2\text{O}$	9.29	9.17	9.24 ± 0.02

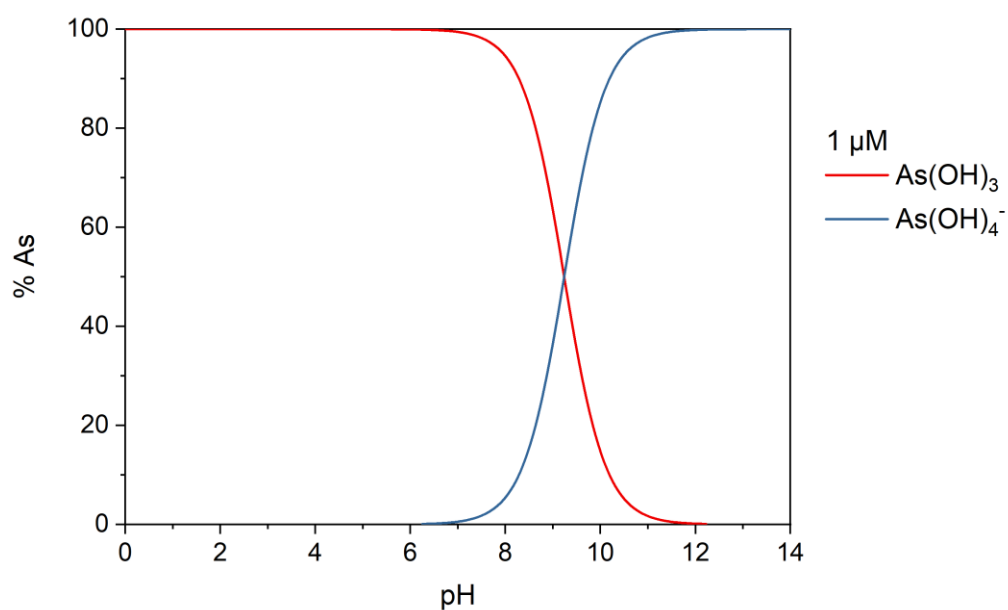
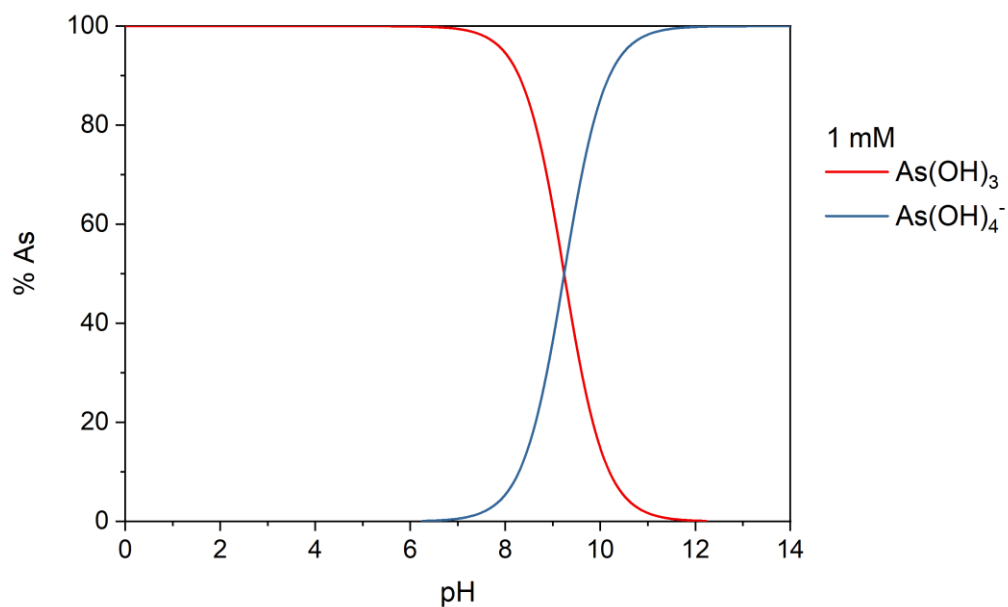
C.F. Baes and R.E. Mesmer, The Hydrolysis of Cations. Wiley, New York, 1976, p. 370.

D.K. Nordstrom and D. Archer, Arsenic thermodynamic data and environmental geochemistry. In: Arsenic in Ground Water. Welch AH, Stollenwerk KG (eds) Kluwer Academic Publishers, Amsterdam, 2003, pp. 1–25.

D.K. Nordstrom, J. Majzlan and E. Königsberger, Thermodynamic properties for As minerals & aqueous species. Reviews in Mineralogy & Geochemistry, 79, 217–255 (2014).

Distribution diagrams

These diagrams have been computed at two As(III) concentrations (1 mM = 1×10^{-3} mol L⁻¹ and 1 μ M = 1×10^{-6} mol L⁻¹) with the 'best' equilibrium constant above (in green). Calculations assume $T = 298$ K for the limiting case of zero ionic strength (*i.e.*, even neglecting plotted ions).



Equilibrium constants for hydrolysis and associated equilibria in critical compilations

Arsenic(V)

Equilibrium reaction	lgK at infinite dilution and $T = 298\text{ K}$			
	Baes and Mesmer, 1976	Khodakovsky et al., 1968	Nordstrom and Archer, 2003	Nordstrom et al., 2014
$\text{H}_2\text{AsO}_4^- + \text{H}^+ \rightleftharpoons \text{H}_3\text{AsO}_4$	2.24	2.21	2.26 ± 0.078	2.25 ± 0.04
$\text{HAsO}_4^{2-} + \text{H}^+ \rightleftharpoons \text{H}_2\text{AsO}_4^-$		6.93	6.99 ± 0.1	6.98 ± 0.11
$\text{AsO}_4^{3-} + \text{H}^+ \rightleftharpoons \text{HAsO}_4^{2-}$		11.51	11.80 ± 0.1	11.58 ± 0.05
$\text{HAsO}_4^{2-} + 2\text{H}^+ \rightleftharpoons \text{H}_3\text{AsO}_4$	9.20			
$\text{AsO}_4^{3-} + 3\text{H}^+ \rightleftharpoons \text{H}_3\text{AsO}_4$	20.70			

C.F. Baes and R.E. Mesmer, The Hydrolysis of Cations. Wiley, New York, 1976, p. 370.

I.L. Khodakovsky, B.N. Ryzhenko and G.B. Naumov, Thermodynamics of aqueous electrolyte solutions at elevated temperatures (Temperature dependence of the heat capacities of ions in aqueous solution). Geokhimiya, 12, 1486–1503, 1968.

D.K. Nordstrom and D. Archer, Arsenic thermodynamic data and environmental geochemistry. In: Arsenic in Ground Water. Welch AH, Stollenwerk KG (eds) Kluwer Academic Publishers, Amsterdam, 2003, pp. 1-25.

D.K. Nordstrom, J. Majzlan and E. Königsberger, Thermodynamic properties for As minerals & aqueous species. Reviews in Mineralogy & Geochemistry, 79, 217–255 (2014).

Distribution diagrams

These diagrams have been computed at two As(V) 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).

