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Equilibrium constants for hydrolysis and associated equilibria in critical compilations

Antimony(III)

Equilibrium reactions	lg*K* at infinite dilution and *T* = 298 K		
	Baes and Mesmer, 1976	Lothenbach et al., 1999; Kitamura et al., 2010	Filella and May, 2003
$Sb(OH)_3 + H^+ \rightleftharpoons Sb(OH)_2^+ + H_2O$	1.41	1.30	1.371
$Sb(OH)_3 + H_2O \rightleftharpoons Sb(OH)_4^- + H^+$	−11.82	−11.93	−11.70
$0.5\ Sb_2O_3(s) + 1.5\ H_2O \rightleftharpoons Sb(OH)_3$	−4.24		
$Sb_2O_3(\text{rhombic,s}) + 3\ H_2O \rightleftharpoons 2\ Sb(OH)_3$		−8.72	−10.00
$Sb_2O_3(\text{cubic,s}) + 3\ H_2O \rightleftharpoons 2\ Sb(OH)_3$			−11.40

C.F. Baes and R.E. Mesmer, The Hydrolysis of Cations. Wiley, New York, 1976, p. 375.

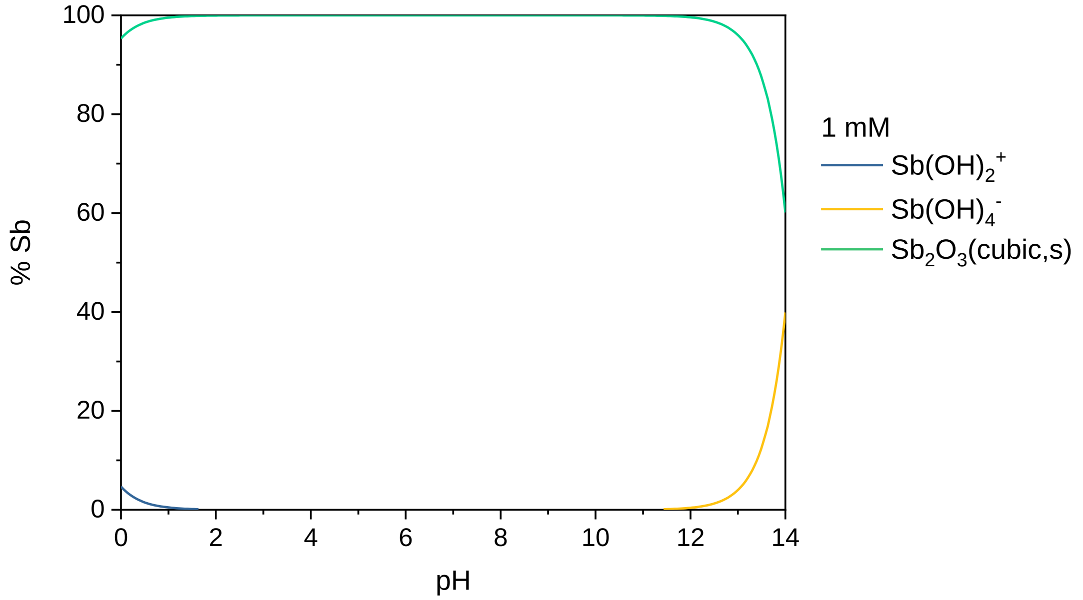
M. Filella and P.M. May, Computer simulation of the low-molecular-weight inorganic species distribution of antimony(III) and antimony(V) in natural waters. Geochim. Cosmochim. Acta 67, 4013-4031 (2003). doi:10.1016/S0016-7037(03)00095-4

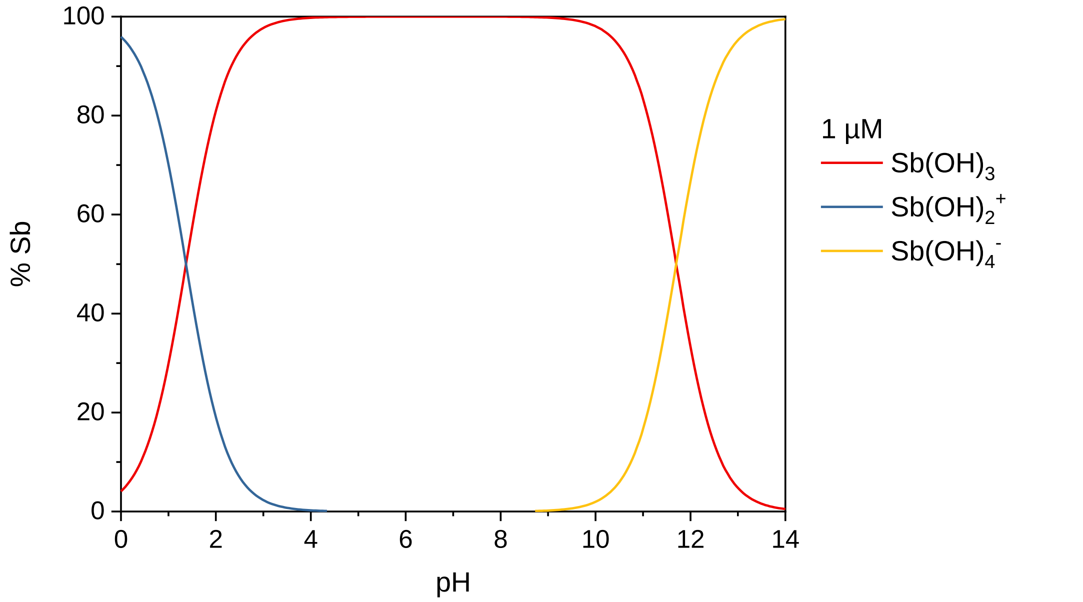
A. Kitamura, K. Fujiwara, R. Doi, Y. Yoshida, M. Mihara, M. Terashima and M. Yui, JAEA Thermodynamic Database for Performance Assessment of Geological Disposal of High-Level Radioactive and TRU-Wastes. Report JAEA-Data/Code 2009-024, Japan Atomic Energy Agency (2010).

B. Lothenbach, M. Ochs, H. Wanner and M. Yui, Thermodynamic Data for the Speciation and Solubility of Pd, Pb, Sn, Sb, Nb and Bi in Aqueous Solution. Japan Nuclear Cycle Development Institute (JNC), TN8400 99-011 (1999).

Distribution diagrams

These diagrams have been computed at two Sb(III) concentrations (1 mM = 1×10^{-3} mol L^{-1} and 1 μM = 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).





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Antimony(V)

Equilibrium reactions	lg*K* at infinite dilution and *T* = 298 K	
	Baes and Mesmer, 1976	Lothenbach et al., 1999; Kitamura et al., 2010
$Sb(OH)_5 + H_2O \rightleftharpoons Sb(OH)_6^- + H^+$	−2.72	−2.72
$12\ Sb(OH)_5 + 4\ H_2O \rightleftharpoons Sb_{12}(OH)_{64}^{4-} + 4\ H^+$	20.34	20.34
$12\ Sb(OH)_5 + 5\ H_2O \rightleftharpoons Sb_{12}(OH)_{65}^{5-} + 5\ H^+$	16.72	16.72
$12\ Sb(OH)_5 + 6\ H_2O \rightleftharpoons Sb_{12}(OH)_{66}^{6-} + 6\ H^+$	11.89	11.89
$12\ Sb(OH)_5 + 7\ H_2O \rightleftharpoons Sb_{12}(OH)_{67}^{7-} + 7\ H^+$	6.07	6.07
$0.5\ Sb_2O_5(s) + 2.5\ H_2O \rightleftharpoons Sb(OH)_5$	−3.7	
$Sb_2O_5(am) + 5\ H_2O \rightleftharpoons 2\ Sb(OH)_5$		−7.400

C.F. Baes and R.E. Mesmer, The Hydrolysis of Cations. Wiley, New York, 1976, p. 375.

A. Kitamura, K. Fujiwara, R. Doi, Y. Yoshida, M. Mihara, M. Terashima and M. Yui, JAEA Thermodynamic Database for Performance Assessment of Geological Disposal of High-Level Radioactive and TRU-Wastes. Report JAEA-Data/Code 2009-024, Japan Atomic Energy Agency (2010).

B. Lothenbach, M. Ochs, H. Wanner and M. Yui, Thermodynamic Data for the Speciation and Solubility of Pd, Pb, Sn, Sb, Nb and Bi in Aqueous Solution. Japan Nuclear Cycle Development Institute (JNC), TN8400 99-011 (1999).

Distribution diagrams

These diagrams have been computed at two Sb(V) concentrations (1 mM = 1×10^{-3} mol L^{-1} and 1 μM = 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).