Titanium(III)

Equilibrium reactions	lg*K* at infinite dilution and *T* = 298 K		
	Perrin et al., 1969	Baes and Mesmer, 1976	Brown and Ekberg, 2016
$Ti^{3+} + H_2O \rightleftharpoons TiOH^{2+} + H^+$	–1.29	–2.2	–1.65 ± 0.11
$2\ Ti^{3+} + 2\ H_2O \rightleftharpoons Ti_2(OH)_2^{4+} + 2\ H^+$		–3.6	–2.64 ± 0.10

C.F. Baes and R.E. Mesmer, The Hydrolysis of Cations. Wiley, New York, 1976, p. 151.

P.L. Brown and C. Ekberg, Hydrolysis of Metal Ions. Wiley, 2016, pp. 433–442.

D.D. Perrin, Dissociation Constants of Inorganic Acids and Bases in Aqueous Solutions. International Union of Pure and Applied Chemistry. Commission on Electroanalytical Chemistry. Butterworths, 1969, pp. 208.

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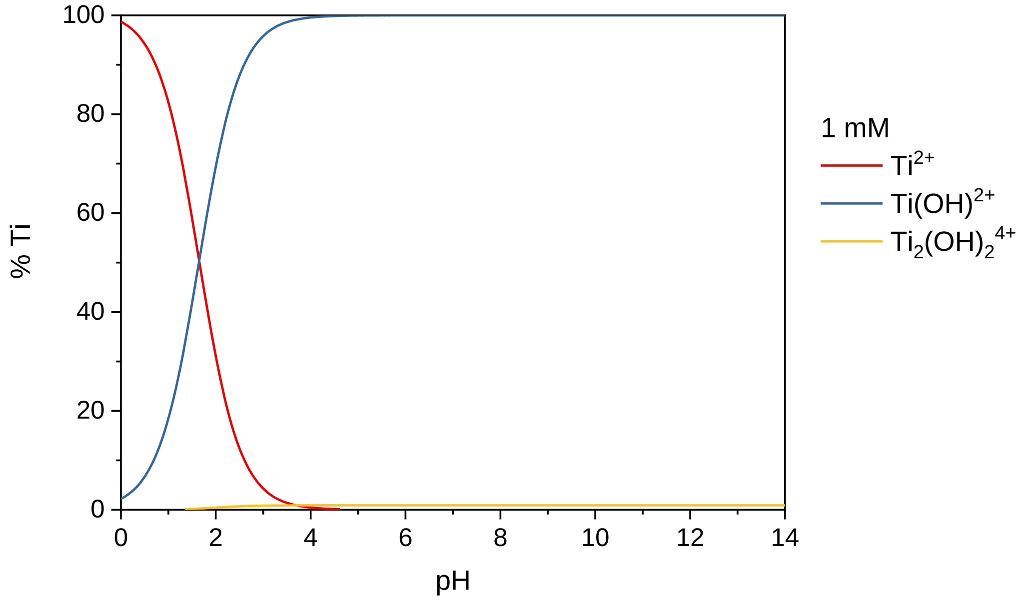
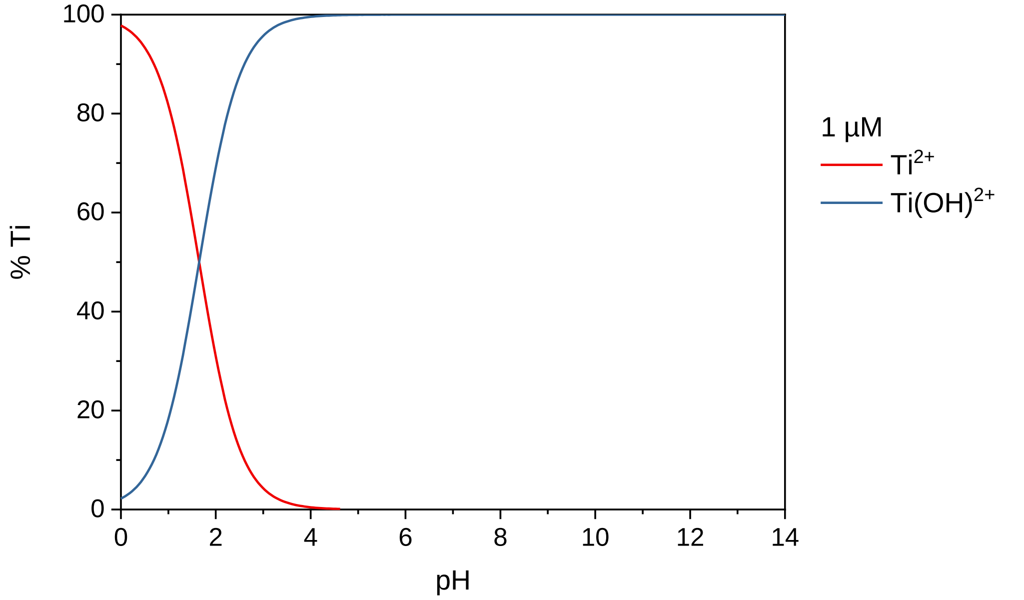
Distribution diagrams

These diagrams have been computed at two Ti(III) concentrations (1 mM = 1x10^{-3} mol L^{-1} and 1 µM = 1x10^{-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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Titanium(IV)

Equilibrium reactions	lg*K* at infinite dilution and *T* = 298 K	
	Baes and Mesmer, 1976	Brown and Ekberg, 2016
$Ti(OH)_2^{2+} + H_2O \rightleftharpoons Ti(OH)_3^{+} + H^+$	⩽–2.3	
$Ti(OH)_2^{2+} + 2\ H_2O \rightleftharpoons Ti(OH)_4 + 2\ H^+$	–4.8	
$TiO^{2+} + H_2O \rightleftharpoons TiOOH^{+} + H^+$		–2.48 ± 0.10
$TiO^{2+} + 2\ H_2O \rightleftharpoons TiO(OH)_2 + 2\ H^+$		–5.49 ± 0.14
$TiO^{2+} + 3\ H_2O \rightleftharpoons TiO(OH)_3^{-} + 3\ H^+$		–17.4 ± 0.5
$TiO(OH)_2 + H_2O \rightleftharpoons TiO(OH)_3^{-} + H^+$		–11.9 ±0.5
$TiO_2(c) + 2\ H_2O \rightleftharpoons Ti(OH)_4$	~ –4.8	
$TiO_2(s) + H^+ \rightleftharpoons TiOOH^+$		–6.06 ± 0.30
$TiO_2(s) + H_2O \rightleftharpoons TiO(OH)_2$		–9.02 ± 0.02
$TiO_2\ x\ H_2O \rightleftharpoons Ti(OH)_2^{2+}[OH^-]$		
$TiO_2(s) + 4\ H^+ \rightleftharpoons Ti^{4+} + 2\ H_2O$		–3.56 ± 0.10

C.F. Baes and R.E. Mesmer, The Hydrolysis of Cations. Wiley, New York, 1976, p. 151.

P.L. Brown and C. Ekberg, Hydrolysis of Metal Ions. Wiley, 2016, pp. 433–442.

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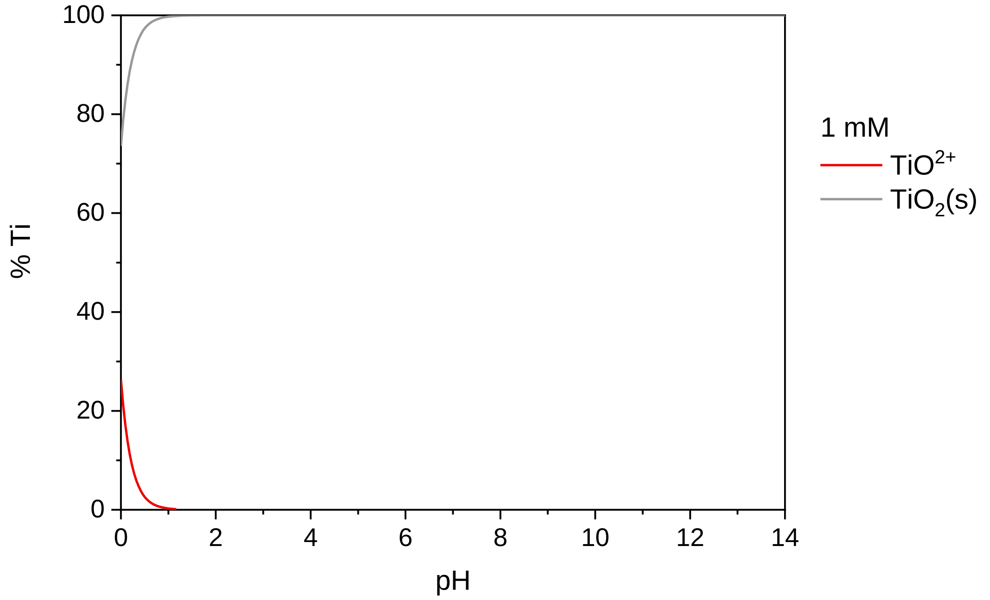
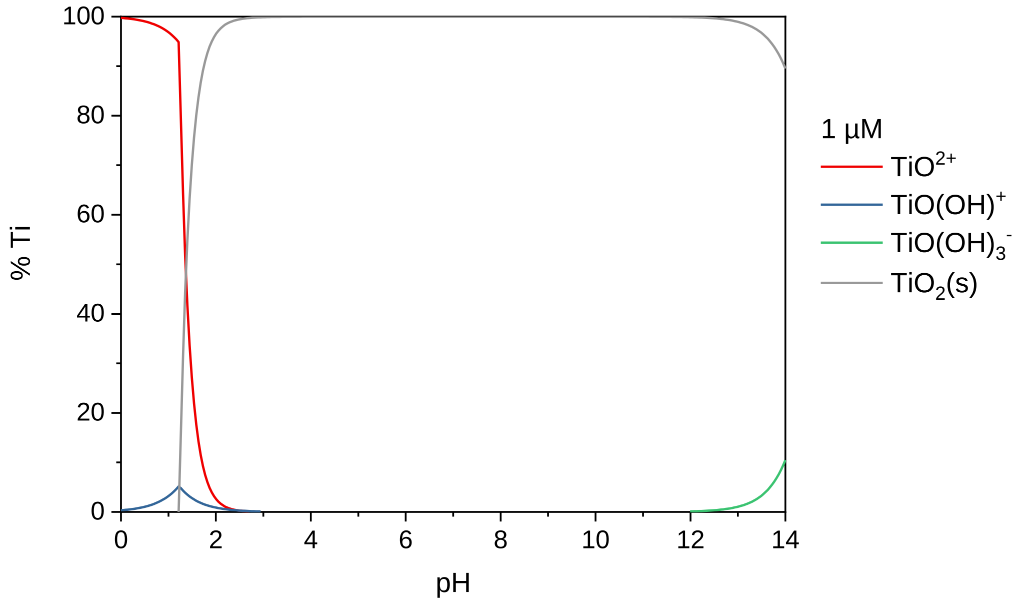
Distribution diagrams

These diagrams have been computed at two Ti(IV) concentrations (1 mM = 1x10^{-3} mol L^{-1} and 1 μM = 1x10^{-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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