

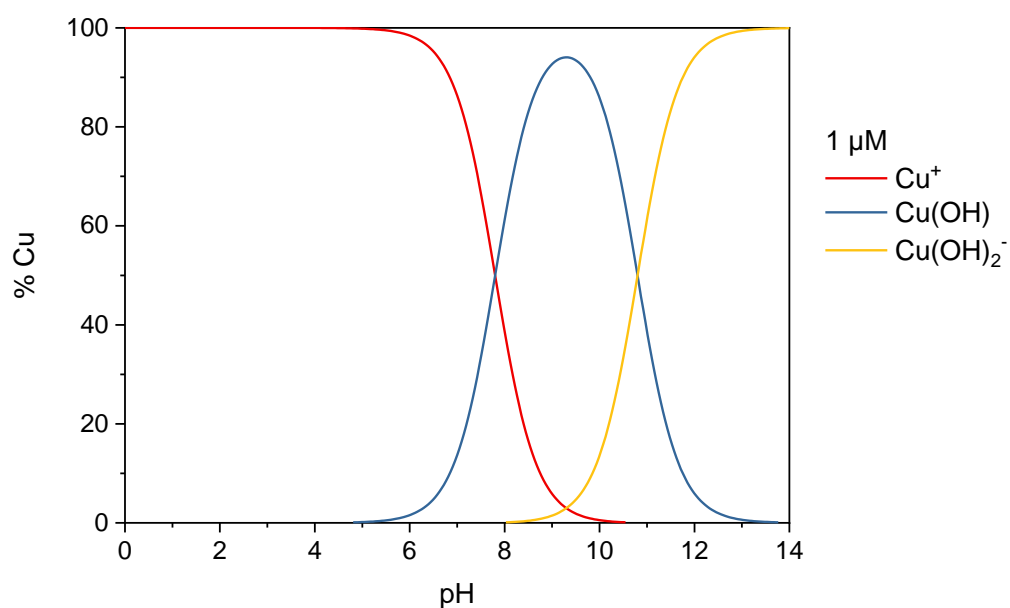
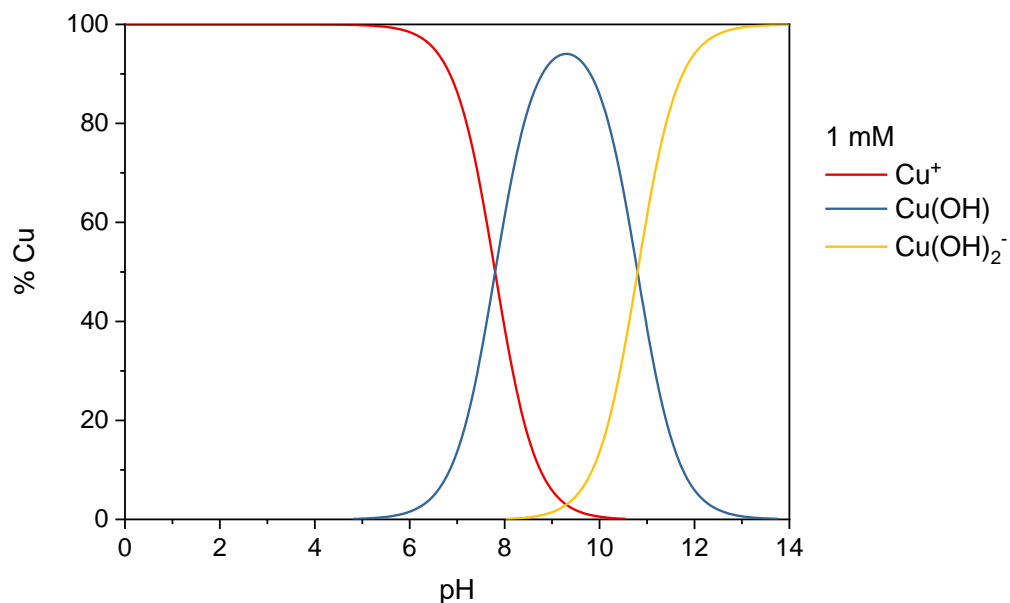
Copper(I)

Equilibrium reactions	lgK at infinite dilution and $T = 298\text{ K}$
	Brown and Ekberg, 2016
$\text{Cu}^+ + \text{H}_2\text{O} \rightleftharpoons \text{Cu}(\text{OH}) + \text{H}^+$	-7.8 ± 0.4
$\text{Cu}^+ + 2 \text{H}_2\text{O} \rightleftharpoons \text{Cu}(\text{OH})_2^- + 2 \text{H}^+$	-18.6 ± 0.6

P.L. Brown and C. Ekberg, Hydrolysis of Metal Ions. Wiley, 2016, pp. 650–702.

Distribution diagrams

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



Equilibrium constants for hydrolysis and associated equilibria in critical compilations

Copper(II)

Equilibrium reactions	lgK at infinite dilution and $T = 298 \text{ K}$				
	Baes and Mesmer, 1976	NIST46	Plyasunova et al., 1997	Powell et al., 2007	Brown and Ekberg, 2016
$\text{Cu}^{2+} + \text{H}_2\text{O} \rightleftharpoons \text{CuOH}^+ + \text{H}^+$	< -8	-7.7	-7.97 ± 0.09	-7.95 ± 0.16	-7.64 ± 0.17
$\text{Cu}^{2+} + 2 \text{H}_2\text{O} \rightleftharpoons \text{Cu(OH)}_2 + 2 \text{H}^+$	(< -17.3)	-17.3	-16.23 ± 0.15	-16.2 ± 0.2	-16.24 ± 0.03
$\text{Cu}^{2+} + 3 \text{H}_2\text{O} \rightleftharpoons \text{Cu(OH)}_3^- + 3 \text{H}^+$	(< -27.8)	-27.8	-26.63 ± 0.40	-26.60 ± 0.09	-26.65 ± 0.13
$\text{Cu}^{2+} + 4 \text{H}_2\text{O} \rightleftharpoons \text{Cu(OH)}_4^{2-} + 4 \text{H}^+$	-39.6	-39.6	-39.73 ± 0.17	-39.74 ± 0.18	-39.70 ± 0.19
$2 \text{Cu}^{2+} + \text{H}_2\text{O} \rightleftharpoons \text{Cu}_2(\text{OH})^{3+} + \text{H}^+$			-6.71 ± 0.30	-6.40 ± 0.12	-6.41 ± 0.17
$2 \text{Cu}^{2+} + 2 \text{H}_2\text{O} \rightleftharpoons \text{Cu}_2(\text{OH})_2^{2+} + 2 \text{H}^+$	-10.36	-10.3	-10.55 ± 0.17	-10.43 ± 0.07	-10.55 ± 0.02

$3 \text{ Cu}^{2+} + 4 \text{ H}_2\text{O} \rightleftharpoons \text{Cu}_3(\text{OH})_4^{2+} + 4 \text{ H}^+$			-20.95 ± 0.30	-21.1 ± 0.2	-21.2 ± 0.4
$\text{CuO(s)} + 2 \text{ H}^+ \rightleftharpoons \text{Cu}^{2+} + \text{H}_2\text{O}$	7.62		7.64 ± 0.06	7.64 ± 0.06	7.63 ± 0.05
$\text{Cu(OH)}_2\text{(s)} + 2 \text{ H}^+ \rightleftharpoons \text{Cu}^{2+} + 2 \text{ H}_2\text{O}$				8.67 ± 0.05	8.68 ± 0.10

C.F. Baes and R.E. Mesmer, The Hydrolysis of Cations. Wiley, New York, 1976, p. 274.

P.L. Brown and C. Ekberg, Hydrolysis of Metal Ions. Wiley, 2016, pp. 650–702.

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

K.J. Powell, P.L. Brown, R.H. Byrne, T. Gajda, G. Hefter, S. Sjöberg and H. Wanner, Chemical speciation of environmentally significant metals with inorganic ligands. Part 2: The $\text{Cu}^{2+} + \text{OH}^-$, Cl^- , CO_3^{2-} , SO_4^{2-} , and PO_4^{3-} systems. Pure Appl. Chem. 79, 895–950 (2007).

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Distribution diagrams

These diagrams have been computed at two Cu(II) 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).

