

Copper(II)

Reaction	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
$\text{Cu}^{2+} + 2 \text{H}_2\text{O} \rightleftharpoons \text{Cu}(\text{OH})_2 + 2 \text{H}^+$	(< -17.3)	-17.3	-16.23 ± 0.15	-16.2 ± 0.2	-16.24 ± 0.03
$\text{Cu}^{2+} + 3 \text{H}_2\text{O} \rightleftharpoons \text{Cu}(\text{OH})_3^- + 3 \text{H}^+$	(< -27.8)	-27.8	-26.63 ± 0.40	-26.60 ± 0.09	-26.65 ± 0.13
$\text{Cu}^{2+} + 4 \text{H}_2\text{O} \rightleftharpoons \text{Cu}(\text{OH})_4^{2-} + 4 \text{H}^+$	-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).

N.V. Plyasunova, M. Wang, Y. Zhang and M. Muhammed, Critical evaluation of thermodynamics of complex formation of metal ions in aqueous solutions II. Hydrolysis and hydroxo-complexes of Cu^{2+} at 298.15 K. *Hydrometallurgy* 45, 37–51 (1997).