

Revised coordination model and stability constants of Cu(II) complexes of tris buffer.

Autorzy

Justyna Nagaj
Kamila Stokowa-Sołtys
Ewa Kurowska
Tomasz Frączyk
Małgorzata Jeżowska-
Bojczuk
Wojciech Bal

Rok wydania

2013

Czasopismo

Inorganic Chemistry

Numer woluminu

52

Strony

13927-13933

DOI

10.1021/ic401451s

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

2-Amino-2-hydroxymethyl-propane-1,3-diol, or tris(hydroxymethyl)aminomethane (Tris), is probably the most common biochemical buffer used alone or in combination with other buffers because it is stable, unreactive, and compatible with most proteins and other biomolecules. Being nontoxic, it has even found applications in medicine. Tris is known, however, to coordinate transition metal ions, Cu(II) among them. Although often ignored, this feature affects interactions of Cu(II) ions with biomolecules, as Tris is usually used in high molar excess. Therefore, it is important to have precise knowledge on the stoichiometry, stability, and reactivity of cupric Tris complexes. The literature data are incoherent in this respect. We reinvestigated the complex formation in the Tris-Cu(II) system by potentiometry, UV-vis, ESI-MS, and EPR at a broad range of concentrations and ratios. We found, contrary to several previous papers, that the maximum stoichiometry of Tris to Cu(II) is 2 and at neutral pH, dimeric complexes are formed. The apparent affinity of Tris buffer for Cu(II), determined by the competitiveness index (CI) approach [Krężel, A.; Wójcik, J.; Maciejczyk, M.; Bal, W. Chem. Commun. 2003, 6, 704-705] at pH 7.4 varies between $2 \times 10(6)$ and $4 \times 10(4)$ M(-1), depending on the Tris and Cu(II) concentrations and molar ratio.

Adres publiczny

<http://dx.doi.org/10.1021/ic401451s>

Strona internetowa wydawcy

<https://www.acs.org/content/acs/en.html>