

Branched peptide with three histidines for the promotion of Cu^{II} binding in a wide pH range – complementary potentiometric, spectroscopic and electrochemical studies.

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Rok wydania

2015

Czasopismo

RSC Advances

Numer woluminu

5

Strony

56922-56931

DOI

10.1039/C5RA08602G

Kolekcja

Naukowa

Język

Angielski

Typ publikacji

Artykuł

Streszczenie

Modifications in linear and cyclic peptides have been widely explored in relation with the associated effects on the coordination of Cu^{II}. Branching of peptides is yet another innovative conception to promote metal binding. The three dimensional (3D), quasi-tripodal structure of the new ligand, H-His-Dap(H-His)-His-NH₂ (3H, where Dap = L-2,3-diaminopropionic acid), which is created by the vicinal two N-terminal and one C-terminal functions of Dap allows triple-arm extension and offers new options in metal binding. A strategy is presented for the characterization of 3H focusing on the role of structural domains in Cu^{II} binding by comparison of analogous tetrapeptides that involve a varying number of His and Gly residues. Potentiometric, spectroscopic (UV-Vis, CD and EPR), mass spectrometric and electrochemical data indicate that in monomeric Cu^{II}-3H complexes the metal is bound with higher affinity compared to its structural domains indicating that the effect of 3D branching should be taken as an important factor for future studies on Cu^{II} peptide constructs.

Adres publiczny

<http://dx.doi.org/10.1039/C5RA08602G>

Strona internetowa wydawcy

<https://www.rsc.org/>

Plik został wygenerowany dnia 2026-04-26 08:53:00

Adres w repozytorium <https://old.chem.uni.wroc.pl/pl/repozytorium/TDIQ8cj>.