

Selective control of Cu(II) complex stability in histidine peptides by β -alanine.

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Streszczenie

The cooperativity of formation of 5-membered and 6-membered chelate rings is the driving force for specificity and selectivity in Cu(II) peptidic complexes. α -Amino acids enable the formation of 5-membered rings, while a 6-membered ring is provided by the coordination of the His side chain imidazole. Introduction of β -alanine is another way of creating a 6-membered ring in the Cu(II) complex. The potentiometric and spectroscopic (UV-vis and CD) study of Cu(II) complexation by a series of four peptides, AAH-am, ABH-am, BAH-am, and BBH-am (where B stands for β -alanine, and -am for C-terminal amide) revealed a very strong effect of the sizes of individual rings, with the order of complex stability AAH-am (5,5,6) > BAH-am (6,5,6) > ABH-am (5,6,6) $\gg$ BBH-am (6,6,6). The stabilities of ABH-am and BAH-am complexes are intermediate between those of strong His-3 peptides but these complexes are still able to saturate the coordination sphere of the Cu(II) ion at neutral pH. This fact opens up new possibilities in engineering specific peptide-based chelates.

Słowa kluczowe

histidine peptides, β -Alanine, Cu(II) complex, spectroscopy, stability constants

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