A Methylenic Group Binds Guanidinoacetic acid to Glycine and Serine in Two Novel Copper(II) Complexes: Synthesis, X-ray-structure and Spectroscopic Characterization

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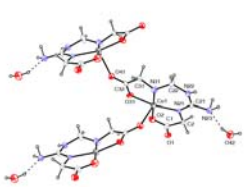
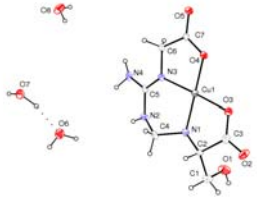
New condensed amino acids were observed in two Cu(II) complexes, both of them involving guanidinoacetic acid (GAA). The copper(II) complexes, 1 and 2, were synthesized and characterized by X-ray crystallography and infrared spectroscopy. Both complexes present an elongation of the carbon chain of the starting amino acid, GAA. Complex 1 presents a new condensed synthetic amino acid, serine-3-N-methylguanidino acetic acid (Ser-mGAA) that is the result/product of the reaction between Gaa and serine, with an unexpectedly increase of one carbon in the chain. In complex 2, a similar ligand to Ser-mGAA was observed, but in this case was a product of reaction between GAA and glycine, that is, glycine-3N-methylguanidino acetic acid (Gly-mGAA). We attempted to propose that Ser-mGAA and Gly-mGAA were formed in two steps. The first one involves a desamidination reaction between two Gaa species, producing the intermediate guanidinodiacetic acid. The second step involves a decarboxylation process between GAA and Ser or Gly.



Complex 1



Complex 2