Stability Constants of Mixed Ligand Complexes of Cu(II) and Atenolol with L-Methionine/L-Cysteine/L-Penicillamine and S-Methyl-L-Cysteine

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Chemical equilibrium studies have been investigated pH metrically in 20% (v/v) ethanol-water mixture in $I = 0.1$ M NaClO₄ at a temperature of 25 degrees for an interaction between Cu (II) and atenolol, (2-[4-[2-hydroxy-3-(propan-2-ylamino) propoxy]phenyl]acetamide, (A) and amino acids, (L):L-methionine, L-cysteine, L-penicillamine and S-methyl-L-cysteine (S). The results of potentiometric titrations were used to infer 1:1:1 ternary complexes, 1:1 and 1:2 binary complexes formation. Conclusively, in ternary complexes that involve amino acids, atenolol is the primary ligand. The stability constants of the complexes were determined based on computer analysis of potentiometric results using the HYPERQUAD program. The relative stability of ternary complexes as compared to that of corresponding binary amino acids complexes can be quantitatively expressed in terms of $\Delta \log K$ and % R.S. The speciation diagrams of various complex species were evaluated as a function of pH.

Keywords: Potentiometric titration; Stability constants; Ternary complexes; Drug; amino acids.

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