

Spectroscopic and conductometric investigation of the interaction of ampicillin with Zn(II) and Mn(II) ions

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Background and Aims: β -lactam antibiotics (e.g., Ampicillin and Amoxicillin) are traditionally used for treatment of common bacterial infections in both human and food-producing animals. Zinc and Manganese are so-called biometal since it enters into the composition of some metalloenzymes necessary for the normal course of biochemical processes. Small amount of Zinc should be constantly taken in by the human body with food.

Methods: Spectroscopic methods were used for the determination of Ampicillin using complex formation with Zn(II) and Mn(II) ions. The complexation of reaction between Zn²⁺ and Mn²⁺ metal cations with Ampicillin were studied in non-aqueous solvent at different temperatures using the conductometric method. The value of log k_f calculated from the absorption spectra and conductivity measurement for Zn(II)-Ampi and Mn(II)-Ampi complexes at 25°C. Enthalpy and Entropy of complexation were determined from the temperature dependence of the complexation constant.

Results: The interaction of Ampicillin with Zn(II) and Mn(II) ions has been found to form one complex with metal to ligand composition of 1:1.

Conclusions: The results show that the complexation formation is affected by the nature of solvents, time, pH, temperature.

Keywords: Ampicillin; Zn (II); Mn (II); Conductometry and Spectroscopic methods