

5th International Conference and Exhibition on Analytical & Bioanalytical Techniques

August 18-20, 2014 DoubleTree by Hilton Beijing, China

Potentiometric study of complexation of levofloxacin with some transition metal ions

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Metal complexes play essential role in pharmaceutical industry and in agriculture. The metallo-elements present in trace quantities play vital roles at the molecular level in living system. The transition metal ions are responsible for proper functioning of different enzymes. The activity of biometals is attained through the formation of complexes with different bioligands and the mode of biological action for complexes depends upon the thermodynamic and kinetic properties. The lipophilicity of the drug is increased through the formation of chelates and drug action is significantly increased due to effective permeability of the drug into site of action. Interaction of various metal ions with antibiotics may enhance their antimicrobial activity as compared to that of free ligand. Metals can play an important role in modifying the pharmacological properties of known drugs after coordinating with it. Stability constants of complexes also have an important role in the design of drugs for alleviation of metal poisoning. The development and scope of transition metal-coordinated antibiotics with promising pharmacological application has been reported as transition metals can interact with a number of negatively charged molecules due to different oxidation states they possess. The present work is a physicochemical investigation of the interaction of some bivalent metal ions with levofloxacin antibiotics and is aimed at understanding the mechanism of inhibitory or lethal effect of antibiotics against fixed types of microorganisms. The stability constants data can also be used for determination of various thermodynamic parameters such free energy (ΔG^0), enthalpy (ΔH^0), and entropy ΔS^0 . From these parameters important information about mechanism of interaction can be deduced.

Biography

Namita Bhardwaj graduated from A. P. S. University Rewa in July 1993 with a Bachelor of Science degree in Biology. She has completed her post graduate studies from A. P. S. University Rewa in July 1995 in Organic chemistry. She started her carrier as an Assistant Professor in May 2001. She conducted a research on 'Polarographic study of Complexation of Pyrimidine bases with Transition metal ions' guided by Dr. M. K. Singh. In August 2008, she joined Dr. C. V. Raman University as an Assistant Professor in Dept.of chemistry, now she is persuing her doctorate in Chemistry on the topic 'Complexation of Transition Metal Ions with some Antibiotics - A Potentiometric Study'. She has published ten research papers in international journals.

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