

5th Global Chemistry Congress

September 04-06, 2017 | London, UK

Encapsulation of β -cyclodextrin with vitamin-B and vitamin-C molecules

Mahendra Nath Roy
North Bengal University, India

We need vitamin B and vitamin C every day for our growth, but if we take them in surplus/less amounts, our growth will be hampered. If these vitamins are taken into our body in encapsulated form, body takes these vitamins according to its requirements and the growth will be normal. Encapsulation of the vitamins is very important to protect these important biomolecules from external hazards, i.e., oxidation, sensitization, photolytic cleavage etc.; for the regulatory delivery of necessary amount of vitamin at the targeted site for a period of time efficiently and precisely and; to prevent overdose. In this work, encapsulation of β -cyclodextrin with two vitamins namely, nicotinic acid and ascorbic acid in aqueous medium have been explored by reliable spectroscopic, physicochemical and calorimetric methods as stabilizer, carrier and regulatory releaser of the guest molecules. Stereochemical nature of the inclusion complexes has been explained by 2D NMR spectroscopy. Surface tension and conductivity studies further support the inclusion process. Isothermal titration calorimetric studies have been performed to determine the stoichiometry, association constant and thermodynamic parameters with high accuracy. The outcomes reveal that there is a drop in ΔS° , which is overcome by higher negative value of ΔH° , making the overall inclusion process thermodynamically favorable. Hence, this exclusive study describes that the inclusion complexes can be used as controlled delivery systems in the field of modern biomedical sciences.



Biography

Mahendra Nath Roy is the Head and Professor in Department of Chemistry at University of North Bengal, India. His research interests are in the areas of "Host-guest inclusion complexes, ionic liquids, solution thermodynamics and polymer chemistry". He reviewed 28 PhD thesis and many referred research papers and authored over 200 research articles and books in Chemistry. He has received award of One Time Grant under Basic Scientific Research from University Grants Commission, Prof. Suresh C Ameta Award from Indian Chemical Society and has been recently awarded with CRSI Bronze Medal 2017 by Chemical Research Society of India for his excellence in chemical research throughout his career.

mahendraroy2002@yahoo.co.in

Notes: