



**INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS**

Name of the Student : DEBASHIS KUNDU

Roll Number : 156107001

Programme of Study : Ph.D.

Thesis Title: DEVELOPMENT OF CELLULOSE, HEMICELLULOSE AND CYCLODEXTRIN BASED HYDROGELS FOR THE IN VITRO RELEASE OF BIOMOLECULES AND METAL ION ADSORPTION

Name of Thesis Supervisor(s) : PROF. TAMAL BANERJEE

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SHORT ABSTRACT

Chemically crosslinked three dimensional hydrogel network has great potential in the field of drug delivery, tissue engineering, adsorption of metal ions and dyes etc. Naturally abundant polysaccharides are excellent choice as precursor for hydrogel because of their biodegradability and ease of functionalization. Herein, variants of cellulose, hemicellulose and cyclodextrin are chemically crosslinked in various molar ratio, to synthesize novel hydrogels. The synthesized hydrogels are characterized by various spectroscopy techniques and rheology whereas morphology of gels are visualized through microscope. The synthesized cellulose-hemicellulose hydrogels are employed for the in vitro delivery of Vitamin B₁₂ and Cephalexin in various physiological buffers. Further, the cyclodextrin based hydrogels are proved to adsorb Cadmium (II) and Nickel (II) from aqueous solution successfully.