INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

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Programme of Study	:	Ph.D.

Thesis Title: Fabrication of Novel Hydrogel Films for Drug Delivery Applications: Influence of Crosslinker and Nanomaterials on Film Properties

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SHORT ABSTRACT

The potential applications of hydrogels, which made up of NaCMC (sodium carboxymethylcellulose), HPMC (hydroxypropylmethylcellulose) and citric acid (CA), have been investigated for wound healing and drug delivery applications in the current work. Significances of findings are: (a) the hydrogel films of NaCMC-HPMC/20% CA are loaded with cationic drug (methylene blue) and the loading efficiency is significantly (approximately 23 times) higher than previous reports. (b) first time, zinc oxide complex of less than 50 nm is synthesized on hydrogel films for wound healing applications. (c) the hydrogel films of NaCMC-HPMC-CuO/20% CA containing spherical nanoparticles of approximately 2-4 nm of Cu and 5-10 nm of Cu_2O are fabricated for wound healing applications. (d) first time, micellar nanoparticles are synthesized from NaCMC and grapefruit seed extract (GFSE) with a size of 50-90 nm. (e) the elongation at break (%) of NaCMC-HPMC-ZnO/1% GFSE hydrogel films is significantly higher than previous reports.