

# **Studies on Composite Wound Dressing Materials for Drug Controlled Release**

*A Major Project Dissertation submitted in partial fulfilment of the requirement for degree of*

## **Master of Technology In Polymer Technology**

*Submitted by*

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## CERTIFICATE

This is certify that this is a bonafide record of project work based on topic **Studies on Composite Wound Dressing Materials for Drug Controlled Release** by **Poonam Kumari (2K11/PTE/08)** This project was carried under my supervision in year 2012-2013 and being submitted in partial fulfilment for the award of degree of Master of Technology, as major project in Delhi Technology University

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## **ABSTRACT**

The present study was focused on preparation of fabric supported hydrogel for drug release application. Acrylamide (AAm) and acrylic acid (AAc) hydrogel were grafted on cotton fabric using ammonium per sulphate as chemical initiator and polyethylene glycol as crosslinker. The major factors affecting graft copolymerization of hydrogel were optimized by varying concentration of monomers and initiator. It was observed that maximum grafting of hydrogel was obtained at 5% APS, 15% acrylamide/acrylic acid concentration. The time of grafting was optioned 45 min at 30°C.

Fabric supported hydrogels were characterized by Fourier Transform Infra-Red (FTIR), scanning electron microscope (SEM), X-ray diffraction (XRD) and thermogravimetric analysis (TGA). Cotton fabric supported hydrogel was loaded with model drug bovine serum albumin (BSA). The release kinetics of drug in different pH were evaluated. It was found that fabric supported hydrogel showed control drug release. The maximum release of drug was found in acidic medium.

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## Abbreviations

AAm	Acrylamide
AAc	Acrylic acid
APS	Ammonium per sulphate
FAS	Ferrous ammonium sulphate
PEG	Polyethylene glycol
BSA	Bovine serum albumin
FTIR	Fourier transform infrared spectroscopy
XRD	X-ray diffraction
TGA	Thermogravimetric analysis
SEM	Scanning electron microscopy
Wg	total weight of the hydrogel grafted cotton fabric
Wd	dry Weight of the cellulose fabric
Ms	mass of swollen hydrogel grafted cotton fabric
Md	dry hydrogel grafted cotton fabric