**Preparation And Evaluation Of Guar Gum And Its Derivative Based Biodegradable Films**

A Major Project-II submitted in the partial fulfilment of the requirement for the

Award of the Degree of

Master of Technology

In

Polymer Science and Technology

To the Faculty of

Delhi Technological University, Delhi

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(2K10/PTY/06)

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Certificate

This is to certify that Ms. REENA have satisfactorily completed the project work entitled “**Preparation And Evaluation Of Guar Gum And Its Derivatives Based Biodegradable Films”** in partial fulfilment of the requirement of the award of Degree of Master of Technology, Delhi during the academic session 2011-2012. This work has not been submitted in part or full in any other University or Institution for award of any other degree or diploma.

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**ACKNOWLEDGMENT**

Any accomplishment requires efforts of many people and this work is no excepetion. I appreciate the contribution and support which various individuals have provided for the successful completion of this project and report.

I wish to thank and express my immense gratitude towards my project supervisior and mentor, **Dr. A.P. Gupta, Professor, Department of Applied Chemistry and Polymer Technology, Delhi Technological University,** who provided me a golden opportunity to work under his able guidance. His scholastic guidance and sagacious suggestions helped to complete the project in this field.

I wish to thank **Prof. G.L.Verma, Head of the Department of Applied Chemistry and Polymer Technology, Delhi Technological University,** for his support and able guidance.

Also I would like to thank **Mr. Gopal Arora, Research Scholar** for his invaluable support.

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**ABSTRACT**

Guar Gum and its derivatives constitutes a large source of materials for applications in the diverse fields, taking advantage of their specific properties (in particular, renewability, biodegradability and biological activity for some of them), especially in the domain of packaging, edible films, tissue engineering, drug vehicles, visco-supplementation, controlled release of drugs, etc. In this work we are preparing blend biodegradable green films of Guar gum and its derivative, using polymers both from natural sources and synthetic ones and evaluate their properties, characteristics and their potential applications in areas of packaging, edible films, biomedical and pharmaceutical. Characterization of synthesized films is carried out using different characterization techniques like FTIR, SEM. Other studies such as swelling-solubility studies in various media and biodegradation studies and their physical properties like mechanical strength using UTM have also been evaluated. FT-IR studies indicate that there is the intermolecular hydrogen bonding interactions, i.e. –OH. . .2OOC– in GG/NaAlg, GG/PVA and CMGG/PVA blends. The blend films also exhibited the improved mechanical properties compared to those of homopolymers. The Carboxymethylated Guar Gum/PVA blend films were also cross linked with calcium chloride. The effect of introduction of calcium chloride on the miscibility, morphology and physical properties of the blend films has also been investigated.

**AIMS AND OBJECTIVE**

Keeping in view the low strength and water solubility behaviour of Guar Gum and its various applications, blend biodegradable films of Guar and its derivate i.e. Carboxymethylated Guar gum using natural polymer, sodium alginate, as well as synthetic polymer, polyvinylalcohol (PVA) have been tailored.

The main objectives of the present project are as follows:

1. To prepare blend films of Guar gum using natural polysaccharide i.e. sodium alginate by solution casting method.

2. To prepare blend films of Guar gum using synthetic polymer i.e. PVA by solution casting method.

3. To prepare blend films of Carboxymethylated Guar gum using synthetic polymer i.e. PVA by solution casting method and were then cross linked with calcium chloride too.

4. To characterize these blend biodegradable films by different physical techniques such as SEM and FTIR for evolution of structural aspects.

5. To study different physical properties like mechanical strength using UTM, swelling-solubility behaviour in different media and biodegradation studies using microbes.