Name of the Scholar	**: Mohd Kashif**
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Department	**: Chemistry**
Title of the of the Thesis	**:Development and Characterization of Poly(urethane-amide) protective coating materials from renewable resource.**

Research Findings

The work in the thesis is focused on the development of Poly(urethane-amide) [PUFA] for the development of high performance coating applications.

The thesis deals with the development of Linseed Oil (LO), Castor Oil (CO) and Pongamia Glabra Oil (PGO) based aliphatic, aromatic isocyanate as well as acrylic and metalloid modified oil fatty amide corrosion protective coatings. Detailed investigations on physico-mechanical and corrosion protective performance of these coatings are reported.

The PhD work described in the thesis is broadly divided into the following eight chapters.

Chapter 1

This chapter contains the general information about the renewable resources, VSO and polymers derived from these, their reactions, VSO based coating materials, their reactions, Corrosion and its prevention by the VSO based coatings and the significance of the work.

Chapter 2

This chapter briefly describes various standard methods and techniques of *characterization.*

Chapter 3

This chapter includes the synthesis of aliphatic isocyanate based PUFA of Linseed, *Pongamia glabra* and Castor seed oils using one shot technique along with minimal solvent to reduce the volatile content.

Chapter 4

In order to see the effect of an aromatic isocyanate on the properties of PU, toluene diisocyanate based PUFA have been synthesized from linseed, pongamia and castor oils as in chapter 3.

Chapter 5

Castor oil based aromatic PUFA shows the best mechanical and corrosion protective properties among all synthesized PUFA. In order to improve the properties of other VSO (linseed and pongamia) PUFA, we have carried out the acrylic modification of linseed oil based PUFA because linseed oil based polyurethane fatty amide shows higher thermal stability as compared to other oil based polyurethane fatty amide. Acrylic modification has been done by the use of hydroxyl terminated acrylic acid to make the more crosslinked structure.

Chapter 6

To see the effect of metalloids such as boron and silicon in the polymeric backbone of PUFA, incorporation of boron in pongamia glabra oil based PUFA by the use of boric acid and silicon in linseed oil based PULFA by the use of tetra ethoxy silane has been performed.

Chapter 7

This chapter includes the corrosion resistance performance of Aliphatic and aromatic PUFA coatings.

Chapter 8

This chapter includes the corrosion resistance performance of Acrylic, boron and silicon modified PUFA coatings.

Conclusion

The incorporation of amide linkage in PU backbone **increases the thermal stability** of the resin. The mechanical and corrosion resistance properties of the coating materials were found superior for aromatic than aliphatic PUFA. The incorporation of acrylate, silicon and boron moiety in the Ar-PUFA remarkable increases the mechanical as well as corrosion resistance properties. Among all the coating systems developed; PULFAS-30 shows best thermal, mechanical and corrosion resistance properties.