

## CHAPTER 3

### APPLIED CHEMISTRY

#### Doctoral Theses

023. AHUJA (Tarushee)  
**Synthesis & Characterization of Immobilizing Materials for Biosensing Application.**  
Supervisors : Dr. D Kumar and Dr. Rajesh  
Th 18045

#### *Abstract*

The primary focus of this work is to develop urea and uric acid biosensors with improved properties such as sensitivity and response time by using different substrates on indium tin-oxide (ITO) glass plates and different methods of immobilization. It also provides a comprehensive study of fabricating different biosensors by using different matrixes and different techniques of transducing. Identifies the already established materials for developing different biosensor which will be used for the detection of urea and uric acid in aqueous solution.

#### *Contents*

1. Introduction. 2. Potentiometric Urea Biosensor based on conducting polymer matrix. 3. Carbon nanotubes/silica composite based potentiometric Urea Biosensor. 4. Self assembled monolayer of silane based Uric Acid Biosensor. 5. Self assembled gold nanoparticles based Uric Acid Biosensor.

024. IRFAN AHMAD MIR  
**Development of Electrically Conductive Adhesives : A Prospective Alternative for Tin/Lead Solders.**  
Supervisor : Dr. D Kumar  
Th 18046

#### *Abstract*

The work is focussed on the synthesis of epoxy based composites. These composites are prepared by using conducting polymers

and carbon nanotubes as fillers in the epoxy matrix and explored for their utility in electronics industry as conductive adhesive. It has incorporate organic conjugated conducting polymers and carbon nanotubes as fillers in an anhydride cured epoxy matrix and study the composites so formed for their use as ICAs. The optimization of filler concentration and its effect on overall properties forms the core of this research work.

#### *Contents*

1. Introduction. 2. Isotropically conductive adhesive with polyaniline powder as filler. 3. Nanocomposites of polyaniline/epoxy as isotropically conductive adhesives. 4. Polypyrrole/epoxy composites as isotropically conductive adhesives. 5. Carbon nanotube filled conductive adhesive.

025. JAIN (Sapna)  
**Synthesis, Characterization and Formulation of Novel Bioactive Compounds.**  
Supervisor : Dr. Archana Rani  
Th 18044

#### *Abstract*

This study is focused on a single molecule to improve bioactivity and to minimize possibilities of resistance and exploitation of synergistic interaction between synthetic compounds (known/unknown) and natural products to obtain novel bioactive formulations. It involves broad spectrum biological screening of a series of compounds initiating with the basic chalcone nucleus for optimization of molecular structure in terms of number and position of double bond and hydroxyl group and their bioactivity against test organisms.

#### *Contents*

1. Introduction. 2. Review of literature. 3. Experimental. 4. Results and discussion. 5. Conclusion and future scope.