

## CHAPTER 7

### CHEMISTRY

#### Doctoral Theses

056. ABDULLAH KHAN

**Design and Synthesis of Novel Benzo[b] 1,4-oxazine, Pyridin-2 (1H)-one and Quinolin-2 (1H)-one Analogues and Their Biological Activity Evaluation.**

Supervisors : Prof. Sunil L. Sharma and Prof. Virinder S. Parmar  
Th 21048

#### *Contents*

1. Design and synthesis of novel benzo[b] 1,4-oxazine analogues and their biological activity evaluation 2. Design and synthesis of novel N-alkyl 5-benzoyl 2-pyridone derivatives and evaluation of their antiproliferative & antibacterial activity 3. Design and synthesis of N- and O-alkylated quinolin-2(1H)-one derivatives. Summary.

057. AGGARWAL (Swati)

**Design, Synthesis and Biological Evaluation of Anticancer Agents for Imaging Applications.**

Supervisors : Prof. Gurmeet Singh and Dr. Anjani K. Tiwari  
Th 21356

#### *Contents*

1. Introduction and objectives 2. Design and synthesis: Structure based drug design and synthesis of molecules targeting duplex DNA 3. Physico-chemical analysis: UV-Vis spectroscopy to study non-radiative excitation and emission transitions 4. CT-DNA binding assay: Exploration of interaction of newly designed molecules with DNA through spectral modifications 5. In-Vivo and In-Vitro analysis: Pharmacokinetics and pharmacodynamics evaluation by biomedical imaging and cellular studies. Summary and list of publications.

058. AHUJA (Preety)  
**Synthesis and Physio Chemical Characterization of Manganese Based Bimetallic Transition Metal Oxides for Supercapacitor Electrode.**  
 Supervisor : Dr. Raj Kishore Sharma  
Th 21047

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1. Introduction 2. Experimental 3. Synthesis and electrochemical characterization of manganese oxide for supercapacitor electrode 4. Strategy to prevail over manganese higher oxides formation 5. Influence of foreign transition metal oxides on manganese oxide performance 6. Formulation of asymmetric supercapacitors employing graphene supported manganese based mixed metal oxides 7. Conclusions and Future perspectives.

059. ALI RAZA  
**Material Synthesis for Forensic Ink Dyes and Explosives Analysis.**  
 Supervisor : Dr. Basudeb Saha  
Th 21357

*Contents*

1. Material synthesis for forensic ink dyes and explosives analysis: An introduction 2. Application of Raman spectroscopy in forensic investigation of questioned documents involving seal inks 3. Silver nanoparticles doped agarose disk: Highly sensitive surface enhanced Raman scattering substrate for In-situ analysis of Ink Dyes 4. In-Situ silver nanoparticles synthesis in agarose film supported on filter paper and its application as highly efficient SERS test stripes 5. Highly sensitive and selective SERS and DLS dual assay for TNT detection using curcumin functionalized silver nanoparticles.

060. AMIT KUMAR  
**Development of New Protocols for the Synthesis of Heterocyclic Frameworks Employing Metal-Catalysis (Gold, Platinum and Indium) and Multicomponent Reactions.**  
 Supervisors : Prof. Sunil K. Sharma and Prof. Virinder S. Parmar  
Th 21045

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1. Introduction to diversity oriented synthesis (DOS) using metal

catalysis and multicomponent reactions 2. Development of synthetic protocols to generate diversely substituted fused indole derivatives 3. Post-Ugi Gold(I) and platinum(II) catalyzed intramolecular hydroarylation to synthesize fused pyrrole derivatives. 4. An expedient route to imidazo[1,4]diazepin-7-ones via a Post-Ugi Gold-catalyzed heteroannulation 5. Design and synthesis of novel N-Alkyl 5-benzoyl 2-pyridone derivatives and their biological evaluation. Summary.

061. AMITA  
**Design, Synthesis and Characterization of Novel, Hydrophilic, Unsymmetrically N, N' -disubstituted Benzimidazolium Salts and their Applications as Organocatalysts, Ligands in Heck Reaction and Fluorescent Probes.**  
 Supervisor : Dr. Marilyn Daisy Milton  
Th 21061

*Contents*

1. Introduction 2. Design, synthesis and characterization of novel, hydrophilic, unsymmetrically N, N' -disubstituted benzimidazolium salts 3. Applications of novel, hydrophilic, unsymmetrically N, N' -disubstituted benzimidazolium salts as organocatalysts 4. Application of novel, hydrophilic, unsymmetrically N, N' -disubstituted benzimidazolium salts as ligands in heck reaction 5. Application of novel, hydrophilic, unsymmetrically N, N' -disubstituted benzimidazolium salts as fluorescent probes 6. Summary and conclusions.

062. ARORA (Richa)  
**In Silico Studies of Hydroxamic Acids and their Biological Applications.**  
 Supervisor : Prof. Rita Kakkar  
Th 21043

*Contents*

1. Benzohydroxamic acid and its applications 2. Computational techniques 3. Theoretical study of the molecular structure and intramolecular proton transfer in benzohydroxamic acid 4. In silico study of the active site of helicobacter pylori urease and its inhibition by hydroxamic acids 5. Identification of novel urease inhibitors : Pharmacophore modeling virtual screening and molecular docking studies 6. Theoretical investigation of organotin(IV) complexes of substituted benzohydroxamic acids 7. Concluding remarks. Bibliography.

063. AWANISH KUMAR  
**Impact of Ionic Liquids on the Stability of Proteins.**  
 Supervisor : Dr. P. Venkatesu  
Th 21040

*Contents*

1. Introduction and review of the literature 2. Materials and experimental techniques 3. Impact of imidazolium-based ionic liquids on the structure and stability of insulin 4. Impact of imidazolium-based ionic liquids on the structure and stability of  $\alpha$ -chymotrypsin 5. Impact of imidazolium-based ionic liquids on the structure and stability of myoglobin 6. Ionic liquids as novel counteracting agents 7. Conclusions.

064. BHARDWAJ (Neha)  
**Studies on the Synthesis and Characterization of Mixed Metal Oxides by Exploratory Approach Through Cation and Anion Substitutions.**  
 Supervisor : Dr. S. Uma  
Th 21051

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1. Introduction 2. Characterization techniques 3. Substitutional studies of  $\text{Cr}^{3+}$  and  $\text{W}^{6+}$  Ions for  $\text{V}^{5+}$  Ions in bismuth and vanadium based columnar oxide : Synthesis, characterization and photocatalytic evaluation of  $\text{Bi}_{13-x}\text{Te}_x\text{V}_4\text{CrO}_{34-\delta}$  ( $2 \leq x \leq 1$ ) and  $\text{Bi}_{13-x}\text{Te}_x\text{V}_4\text{W}_{34-\delta}$  ( $2 \leq x \leq 1$ ) 4. Investigation of cationic mixing and ordering in the honeycomb layer of  $\text{Li}_4\text{MSbO}_6$  ( $\text{M(III)} = \text{Cr, Mn, Al, Ga}$ ) (S.G. C2/c) oxides 5. Investigation of synthesis of oxynitrides  $\text{Ln}_2\text{MoTi(ON)}_{7-\delta}$  ( $\text{Ln} = \text{Eu, Gd, Dy, Y}$ ;  $\delta = \text{vacancies}$ ) by the ammonolysis of single phase oxides  $\text{Ln}_2\text{MoTiO}_8$  ( $\text{Ln} = \text{Eu, Gd, Dy, Y}$ ) and their characterizations 6. Synthetic attempts of ammonolysis of mixed phase oxides leading to  $(\text{AA}')\text{BO}_{4-(x+y)}\text{N}_x\text{O}_y$  ( $x \sim 0.1$ ;  $y \sim 0.5$ ;  $\text{A} = \text{K, Rb, Cs}$ ;  $\text{A}' = \text{Sr, Ba}$ ;  $\text{B} = \text{W, Mo}$ ).

065. DANODIA (Abhinandan Kumar)  
**Palladium-Catalyzed Tandem Synthesis of Carbocycles and Heterocycles by Sequential Coupling Reaction.**  
 Supervisor : Dr. Akhilesh Kumar Verma  
Th 21046

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1. Palladium-catalyzed sequential cross-coupling reaction of

hindered aromatic/heteroaromatic dihalide 2. Palladium-catalyzed sequential Sonogashira/Suzuki coupling reaction and concomittant cyclization : A concise tandem route to phenanthrenes, naphthothiophenes and bibenzo-indenothiophene 3. Palladium-catalyzed direct synthesis of functionalized carbazoles from indoles via triple oxidative heck (fujiwara-moritani) alkenylation/cyclization 4. Iodine-mediated electrophillic cyclization of enediynes : A convient route to indo-substituted indenenes. Summary of the work.

066. GABA (Garima)  
**Studies on the Interaction of Metal Ions with Curcumin and its Analogues : NF- $\kappa$ B-DNA Binding Inhibitors.**  
 Supervisor : Prof. R. K. Sharma  
Th 21054

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1. Introduction 2. Instrumentation and theory of the techniques used 3. Molecular modelling and formation constant studies on curcumin and its metal complexes 4. Molecular modelling and formation constant studies on demethoxycurcumin and its metal complexes 5. Molecular modelling and formation constant studies on bisdemthoxycurcumin and its metal complexes 6. Comparative antioxidant, molecular modelling and Zinc Chelation studies on curcumin and its analogous (DMC & BDMC) and their correlation with NF- $\kappa$ B- DNA binding inhibitory activity. Summary and Publications.

067. GULIA (Sunita)  
**Theoretical Studies of Bioconjugated and Transition Metal Doped ZnO Quantum Dots.**  
 Supervisor : Prof. Rita Kakkar  
Th 21058

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1. ZnO quantum dots : A brief introduction 2. Computational techniques 3. Effects of passivation on stuctural and electronic properties of ZnO quantum dots 4. Investigating the adsorption of DNA nucleobases/base pairs on (ZnO)<sub>n</sub> (n=3, 4, 6, 9) quantum dots by first principles calculations 5. The stuctural, electronic and magnetic properties of the 3d TM (Sc, Ti, Cr, Mn, Fe, Co, Ni and Cu) doped ZnO quantum dots 6. Theoretical investigation of Glycine-(ZnO)<sub>12</sub> and Cysteine-(ZnO)<sub>12</sub> complexes. 7. Concluding Remarks. Bibliography.

068. GUPTA (Dinesh)  
**Catalytic Oxidation and Dehydration of Substrates of Industrial Relevance.**  
 Supervisors : Dr. Basudeb Saha and R. K. Sharma  
Th 21354

*Contents*

1. General introduction 2. Design of green heterogeneous, stable many times reusable nanocatalyst. (a) Glu TsOH-Ti and (b) Ni-Cu/HT (C) Ru/CNS 3. Dehydration of lignocellulosic biomass using large-pore mesoporous tin phosphate (LPSnP-1 as catalyst 4. Biorenewable sulfonated carbonaceous material: An efficient solid acid catalyst for 5-Hydroxymethylfurfural and furfural production 5. Aerobic oxidation of 5-hydroxymethylfurfural to 2,5-diformylfuran and 2,5 furandicarboxylic acid 6. Green environmental friendly routes For p-Xylene oxidation to terephthalic acid.

069. HEMLATA NIMESH  
**Design, Synthesis and Pharmacological Evaluation of Novel Bisbenzimidazole Analogues as Radioprotectors.**  
 Supervisor : Prof. Vibha Tandon  
Th 21358

*Contents*

1. Review of literature 2. Synthesis of novel bisbenzimidazole derivatives as radioprotectors 3. To study the toxicity, pharmacokinetics and biodistribution of DMA in Balb/c Mice 4. To Elucidate the radioprotective efficacy of DMA in Balb/c Mice exposed to ionizing radiation.

070. JHA (Rajeev Ranjan)  
**Transition-Metal-Catalyzed Tandem Synthesis of Heterocycles/ Polyheterocycles from Alkynes.**  
 Supervisor : Dr. Akhilesh Kumar Verma  
Th 21039

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1. Catalyst-controlled regio-and stereoselective synthesis of oxazolo fused pyrroloquinolines and naphthyridines from o-alkynylaldehydes 2. Stereoselective tandem synthesis of thiazolo fused naphthyridines and pyridines from o-alkynylaldehydes via 6-endo-dig ring closure 3. Palladium-catalyzed-regioselective (3+2) annulation of internal alkynes and iodo-pyranoquinolines

with concomitant ring opening 4. Copper-catalyzed tandem synthesis of bisindolo/pyrrolo[2,1-a]isoquinolines via hydroamination of o-haloarylalkynes followed by C-2 arylation. Summary of the work.

071. KAPIL  
**Click-Chemistry Route to Triazol-Linked Nonionic Bicyclonucleoside Dimers, Fluorescent Coumarin-4-yl-triazolyglycosides and Solvent-Free Synthesis of 4-Coumarin-4'-yl-dihydropyridines.**  
 Supervisor : Prof. Ashok K. Prasad  
Th 21056

*Contents*

1. Synthesis of triazol-linked nonionic bicyclonucleoside dimers. 2. Synthesis and fluorescence study of coumarin-4-yl-triazolyglycosides. 3. Biocatalytic separation of  $\alpha$ - and  $\beta$ -anomers of coumarin-4-yl-triazolyldeoxyriboglycosides. 4. Solvent-free multi-component one-pot synthesis of novel 4-coumarin-4'-yl-dihydropyridines. Summary and List of Publications.

072. MANJU KUMARI SAROJ  
**Photophysical Study of Some Indole Based Chalcones in Homogeneous and Heterogeneous Media Using Their Absorption and Fluorescence Spectral Profiles.**  
 Supervisor : Prof. R. C. Rastogi  
Th 21041

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1. Introduction. 2. Materials and methods. 3. Solvatochromic study : Ground and excited state dipole moments using solvent polarity parameters. 4. Prototropic study : Effect of  $H_o/PH/H_-$  on absorption and fluorescence spectra. 5. Solubilization studies in CTAB, SDS and Tx-100. 6. Inclusion complexation with  $\beta$ -cyclodextrin. Concluding remarks and Publications/Posters presented.

073. MOHD. RASHID  
**Synthesis, Antimicrobial Evaluation and X-Ray Studies of Some Novel Heterocycles.**  
 Supervisors : Prof. S. C. Jain and Dr. Surendra Singh  
Th 21057

*Contents*

1. Synthesis and antimicrobial activity of novel methyl 2-methoxy-6-substitutedbenzoates 2. Design and synthesis of some novel methyl 2-methoxy-6-(7-N/S-heterocyclyl-1-(phenylsulfonyl)heptyl)benzoates and their antimicrobial activity. 3. Synthesis of some new 4-(6-(4-((N/O-heterocyclyl)methyl)-1H-1,2,3-triazol-1-yl)hexyl)-2H-benzo[b][1,4]oxazin-3(4H)-ones with their antimicrobial evaluation 4. Synthesis and biological activity of 4-((5-(((1-aryl-1H-1,2,3-triazol-4-yl)methyl)thio)-1,3,4-oxadiazol-2-yl)methyl)-2H-benzo[b][1,4]oxazin-3(4H)-ones. 5. Synthesis and X-ray studies of some novel heterocycles. Summary.
074. PAL (Renu)  
**Probing Solute-Solute and Solute-Solvent Interactions of Amino Acid +Carbohydrate/Drug +Water Systems Using Physicochemical Methods.**  
 Supervisor : Dr. Anil Kumar Nain  
Th 21053

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1. Introduction 2. Experimental 3. Volumetric, ultrasonic and viscometric behavior of *l*-histidine in aqueous-glucose solutions at different temperatures 4. Study of solute-solute and solute-solvent interactions of *l*-histidine in aqueous-sucrose solutions at different temperatures using volumetric, ultrasonic and viscometric methods 5. Physicochemical studies of solute-solute and solute-solvent interaction of *l*-threonine in water and water +glucose solutions at 293.15, 298.15, 303.15, 308.15, 313.15 and 318.15 K 6. Thermodynamic and physicochemical studies of solute-solute and solute-solvent interations of *l*-threonine in water and aqueous-sucrose solutions at different temperatures 7. Study of solute-solute and solute-solvent interactions of *l*-phenylalanine in water and water +arabinose/glucose/sucrose (2.5%, 5%) solutions at different temperatures 8. Investigation of solute-solute and solute-solvent interactions and group contributions of glycine/ *l*-alanine/*l*-valine/*l*-isoleucine in water + aqueous-streptomycin (1%, 2%) solutions at different temperatures. Summary and List of Publications.



075. PRAMOD KUMAR  
**Synthesis of Core and Core-Shell Inorganic Nanoparticles for Application in Drug Delivery.**  
 Supervisor : Dr. Indrajit Roy  
Th 21355

*Contents*

1. Introduction 2. Literature review 3. Experimental and characterization techniques 4. Preparation and characterization of gold nanospheres and nanorods, with potential application in catalysis and light-activated therapy 5. Preparation and characterization of superparamagnetic Iron-Oxide nanoparticles for magnetically guided drug delivery 6. Preparation and characterization of organically modified silica (Ormosil) nanoparticles as a sustained release drug delivery vehicle 7. Preparation and characterization of a Dual-Modality, core (Iron-Oxide)-Shell (Ormosil) nanoprobe, co-encapsulating a fluorophore, for application in In vitro bioimaging. 8. Conclusion and list of publication.

076. PRASHANT KUMAR  
**Studies on the Energy Efficient and Cost Effective Solution Based Synthesis of Copper Sulfides, Iron Sulfides and Copper Iron Sulfides, their Structure and Some Properties.**  
 Supervisor : Dr. S. Uma  
Th 21353

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1. Introduction 2. Characterization techniques 3. Copper-Sulfur system 4. Iron-Sulfur system 5. Copper-Iron-Sulfur system. References and publications.

077. RAVINDER KUMAR  
**Copper (II) Complexes of Schiff Bases Derived from a Benzimidazolyl Amine and its N-Substituted Derivative: Structural, Spectral, Morphological and Catalytic Studies.**  
 Supervisor : Prof. Pavan Mathur  
Th 21042

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1. Introduction 2. Principles of techniques employed for characterizing schiff base ligands and their copper (II) complexes 3. Synthesis, structural and spectral characterization

of benzimidazolyl schiff base ligands 4. Synthesis, structural, spectral, magnetic and electrochemical studies of copper (II) complexes of benzimidazolyl schiff bases 5. Homogeneous and heterogeneous catalytic oxidation of substituted benzyl alcohol, hydrocarbon, 1,10-phenanthroline and substituted alkynes. Summary.

078. REENA  
**Design, Synthesis and Biological Studies of Some Novel Pyridine and Triazole Based Heterocycles.**  
 Supervisor : Prof. S. C. Jain  
Th 21049

*Contents*

1. Synthesis of some novel pharmacophores using sulfone chemistry 2A. Synthesis of some biologically active novel (E)-1-(5-methyl-1-(pyridin-3-yl)-1H-1,2,3-triazol-4-yl)-3-aryl-prop-2-en-1-odnes. 2B. Synthesis and biological evaluation of some new triazolypyridines bearing peptide bond 3A. Design and synthesis of N<sup>2</sup>-(indolinylidene/arylidene)-5-methyl-1-(pyridin-3-yl)-1H-1,2,3-triazole-4-carbohydrazides in aqueous medium. 3B. Synthesis of some novel 4-arylidenamino-5-(5-methyl-1-(pyridin-3-yl)-1H-1,2,3-triazol-4-yl)-4H-1,2,4-triazole-3-thiols of biological importance 4. Synthesis of some novel peptidic thiazoles and oxadiazoles of biological interest 5. Design, synthesis and antimicrobial evaluation of some novel triazoles using click chemistry. Summary.

079. SALUJA (Pooja)  
**Synthesis of Heterocycles Using DBU, Gl. AcOH and TSIL, their Photophysical and Biological Studies, and Oxidations Catalyzed by La(OTf)<sub>3</sub>.**  
 Supervisor : Prof. J. M. Khurana  
Th 21044

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1. DBU : A highly efficient catalyst for one pot synthesis of substituted 4H-benzo[g]chromenes, 4H-pyrans and pyrano[2,3-c]phenazine and benzo[a]chromeno[2,3-c]phenazine derivatives via four component domino protocol and their photophysical studies 3. TSIL catalyzed synthesis of novel naphthoquinone-urazole hybrids and evaluation of their antioxidant and in vitro anticancer activity 4. An efficient and convenient approach for the synthesis of novel pyrazolo[1,2-a]triazole-triones by glacial

acetic acid catalyzed three component condensation and evaluation of their antimicrobial activities 5. Lanthanum triflate catalyzed rapid oxidation of 1,2-diols,  $\alpha$ -hydroxyketones and alcohols with urea-hydrogen peroxide (UHP) in ionic liquid. 6. Summary and conclusions.

080. SANJEEV KUMAR  
**Synthesis and Characterization of Cobalt and Ruthenium Dithiocarbamate Coordination Polymer Nanoparticles and their Application in Photovoltaics, Sensing and Targeted.**  
 Supervisor : Dr. Raj Kishore Sharma  
Th 21351

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1. Introduction 2. Synthesis and characterization of infinite coordination polymer nanoparticles 3. Cobalt and ruthenium dithiocarbamate coordination polymer nanowires: Materials for Low-Cost photovoltaics 4. Infinite coordination polymer/graphene nanoribbons composites: Electrochemical biosensors for hydrogen peroxide 5. Biological activity of coordination complex nanoparticles: Morphology dependent study 6. Summary, conclusions and further perspectives.

081. SHARMA (Vivek Kumar)  
**Chemo-enzymatic Synthesis of C-4'-Spiro- & Locked-ribonucleosides and Efficient Route to Mercaptoacetamido- & Triazolo-linked sugar Modified Nucleoside Dimers.**  
 Supervisor : Prof. Ashok K. Prasad  
Th 21062

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1. Chemo-enzymatic synthesis of spiro-4'-C-methylene,5'-O-ribonucleosides 2. Chemo-enzymatic convergent synthesis of 2'-O,4'-C-methylene-ribonucleosides 3. Design and synthesis of mercaptoacetamido-linked sugar modified nucleoside dimers 4. Design and synthesis of triazolo-linked sugar modified nucleoside dimers. Summary.

082. SINGH (Harjinder)  
**Synthesis of Substituted-1,2,3-Triazoles, their Conjugates and Evaluation of Biological and/or Photophysical Properties.**  
 Supervisor : Prof. J. M. Khurana  
Th 21038

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1. 1,2,3-triazoles : A versatile tool for developing novel molecules with biological and industrial applications: A brief review 2. Efficient, green and regioselective synthesis of 1,4,5-trisubstituted-1,2,3-triazoles in ionic liquid [bmim]BF<sub>4</sub> and in TSIL [bmim]OH 3. Ultrasound promoted one pot synthesis of novel fluorescent triazolyl spirocyclic oxindoles using DBU based TSILs and their antimicrobial activity 4. A facile eco-friendly one pot five-component syntheses of novel 1,2,3-triazole linked pentasubstituted-1,4-dihydropyridines and their biological and photophysical studies 5. Efficient one pot synthesis of xanthene-triazole-quinoline/phenyl conjugates and their antimicrobial activity 6. Syntheses, biological evaluation and photophysical studies of novel 1,2,3-triazole containing azo dyes 7. Determination of dipole moment, solvatochromic studies and application as turn off-on fluorescence chemosensor of new 3-(4-(dimethylamono)phenyl)-1-(5-methyl-1-(naphthalen-1-yl)-1H-1,2,3-triazol-4-yl)prop-2-en-1-one 8. Summary and conclusions.

083. SINGH (Henam Premananada)  
**Synthesis of Some Inorganic Nanoparticles and their Applications as Catalyst, MRI Contrast and Drug Delivery Agents.**  
 Supervisor : Dr. Rakesh Kumar Sharma  
Th 21059

*Contents*

1. Introduction 2. Literature review 3. Experimental and characterization techniques 4. Synthesis of bimetallic Pt-Cu nanoparticles and their application in the reduction of rhodamine B 5. Plant extract : Green route for the synthesis of metal nanoparticles and their catalytic performance. 6. Hollow silica nanoparticles as support for catalase enzyme immobilization 7. Surface modified silica nanoparticles for synchronous magnetic resonance imaging and drug delivery applications. 8. Conclusions.

084. SOHAIL AHMAD  
**Chemical Studies of Selected Synthetic Porphyrinoids and Core Modified Porphyrinoids.**  
 Supervisor : Prof. S. M. S. Chauhan  
Th 21060

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1. Synthesis of 5,10,15,20-tetraarylporphyrinatoiron(III) chlo-

ride and their application in oxygenation and oxidation of phenols with  $H_2O_2$  in imidazolium ionic liquids 2. The modification of selected of 5,10,15,20-tetraarylporphyrins and their uses in the generation of singlet oxygen 3. Synthesis of 5,10,15,20-meso-unsubstituted and 5,10,15,20-meso-substituted-21,23-ditellura/diselena core-modified porphyrinogens : oxidation and detection of toxic metals 4. Synthesis of tellurium and selenium core-modified calixiphyrins from tripyrranes and their applications in detection of toxic metals 5. Synthesis of selenium and tellurium core-modified carbaporphyrinogens their oxidation to corresponding porphyrins.

085. SRIVASTAV (Shruti)  
**Modeling for Chronoamperometry, Chronocoulometry, Potential and Light Modulated Admittance for Stochastically Rough Electrode in Moderately Supported Conditions.**  
 Supervisor : Prof. Rama Kant  
Th 21055

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1. Electrochemical response at disordered interfaces under moderately supported conditions : An introduction 2. Theory of anomalous cottrellian current in presence of uncompensated solution resistance 3. Influence of uncompensated solution resistance on chronocoulometry of reversible charge transfer at rough electrode. 4. Influence of uncompensated solution resistance on anomalous warburg impedance 5. EIS of quasireversible charge transfer at rough electrode : Bias voltage dependence & uncompensated solution resistance 6. Influence of uncompensated solution resistance on diffusion limited adsorption at rough electrode 7. Experimental validation of roughness power spectrum based theory of anomalous cottrell and anomalous warburg response 8. Electrochemical and optoelectrical admittance at illuminated rough semiconductor electrodes. 9. Summary and Prospects.

086. VANDANA  
**Transition Metal Complexes of Some Schiff's Base Ligands : Synthesis, Spectral Characterization and Biological Studies.**  
 Supervisor : Dr. Sulekh Chandra  
Th 21050

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1. Introduction 2. Synthesis and characterization of semicarbazone

and thiosemicarbazone ligands 3. Synthesis of manganese(II) complexes and studies on their structural and spectral characteristics 4. Synthesis of cobalt(II) complexes and studies on their structural and spectral characteristics 5. Synthesis of nickel(II) complexes and studies on their structural and spectral characteristics 6. Synthesis of copper(II) complexes and studies on their structural and spectral characteristics 7. Biological studies of ligand and their transition metal complexes. Summary.

087. VIKRAM SINGH  
**Copper Complex Based Monolayers for DNA Cleavage.**  
Supervisor : Dr. Satish K. Awasthi  
Th 21352

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1. Introduction: An overview of copper complex based nuclease activity and DNA cleavage on solid support 2. Synthesis of polypyridine and imidazole based copper complexes 3. DNA binding and cleavage activity of copper complexes 4. Fabrication of monolayers and their nuclease activity 5. Further perspective of the monolayers.

088. YOGESH KUMAR  
**Microwave-Assisted, D-Glucose Mediated Synthesis of Triazoles, Triazolylated-Benzimidazoles and Triazolylated-Thiazolidinones.**  
Supervisor : Dr. B. K. Singh  
Th 21052

*Contents*

1. Microwave-assisted, D-glucose mediated copper(I) catalyzed triazoles synthesis 2. Microwave-assisted, D-glucose mediated copper(I) catalyzed, one-pot, three-component 1,2,3-triazolylated-benzimidazoles synthesis 3. Microwave-assisted, D-glucose mediated copper(I) catalyzed, one-pot, four-component triazolylated-thiazolidinones synthesis. Summary.