

*This Thesis is Dedicated*

*To*

*My Beloved Parents And  
Wife, And My Respected  
Supervisor*

## Anti-plagiarism Report of Ph.D. Thesis

Title of the Thesis: "INVESTIGATION OF SOLUTION BEHAVIOUR AND INCLUSION COMPLEXATION OF SOME NOTEWORTHY COMPOUNDS WITH THE MANIFESTATION OF ASSORTED INTERACTIONS PREVALENT IN AQUEOUS AND NON-AQUEOUS SYSTEMS"

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## **DECLARATION**

I declare that the thesis entitled “**INVESTIGATION OF SOLUTION BEHAVIOUR AND INCLUSION COMPLEXATION OF SOME NOTEWORTHY COMPOUNDS WITH THE MANIFESTATION OF ASSORTED INTERACTIONS PREVALENT IN AQUEOUS AND NON-AQUEOUS SYSTEMS**” has been prepared by me under the guidance of Dr. Mahendra Nath Roy (Principal Supervisor), Professor of Chemistry, University of North Bengal and Dr. Deepak Ekka (Co-Supervisor), Asst. Professor of Chemistry, Cooch Behar Panchanan Barma University. No part of this thesis has formed the basis for the award of any degree or fellowship previously.


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## CERTIFICATE

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I am evermore aware of what a huge debt I owe to the sources of the information required for my research work: the numerous books, monographs, articles, computer website, etc. I put on record some measure of my gratitude to those whose references I have cited in this thesis.

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## **PREFACE**

The work in this thesis entitled **“INVESTIGATION OF SOLUTION BEHAVIOUR AND INCLUSION COMPLEXATION OF SOME NOTEWORTHY COMPOUNDS WITH THE MANIFESTATION OF ASSORTED INTERACTIONS PREVALENT IN AQUEOUS AND NON-AQUEOUS SYSTEMS”** was initiated in 2016 under the guidance of Dr. Mahendra Nath Roy (Principal Supervisor), Professor of Chemistry, University of North Bengal and Dr. Deepak Ekka (Co-Supervisor), Asst. Professor of Chemistry, Cooch Behar Panchanan Barma University. This research was become conscious within the framework of the Programme in the field of **“Host-Guest Inclusion Complexation and Solution Behaviour of Some Noteworthy and Biologically Potent Molecules”**.

The work is an attempt to explore the supramolecular “Host-Guest” inclusion complexation of some important molecules (including drugs) by various physicochemical and spectroscopic methods and to make them more bioavailable by increasing their solubility and controlled release without any chemical modification. Beside, molecular interaction in some aqueous and non-aqueous electrolytic solutions has been investigated by studying their thermodynamic and transport properties.

During the course of my research work, I was privileged to participate in several meets and seminars across the country. I was highly inspired by listening and interacting with distinguished experts and scientists. I was very fortunate to publish my works in the national and International Journals of repute.

In keeping with general practice of reporting scientific observation, due acknowledgement has been made whenever the work described was based on the findings of the other investigators. I must take the responsibility of any unintentional oversights and errors, which might have crept in spite of precautions.

I hope I will be given more challenges in my life so that the knowledge that I have earned during my work can be put into action in the future.



## LIST OF TABLES

CHAPTERS	TABLES	PAGE NO.
<b>Chapter IV</b>	<p><b>Table IV.1.</b> The density (<math>\rho</math>), viscosity (<math>\eta</math>) and relative permittivity (<math>\epsilon_r</math>) value of methylamine solution at <math>T = 298.15 \text{ K}^a</math></p> <p><b>Table IV.2.</b> Molar conductance (<math>\Lambda</math>) with corresponding concentration (<math>c</math>) of <math>[\text{Bu}_4\text{PCH}_3\text{SO}_3]</math> in methylamine solution at <math>T = 298.15 \text{ K}</math></p> <p><b>Table IV.3.</b> The calculated limiting molar conductance of ion-pair (<math>\Lambda_0</math>), limiting molar conductance of triple-ion (<math>\Lambda_0^T</math>), slope and intercept of Eq. (2) for <math>[\text{Bu}_4\text{PCH}_3\text{SO}_3]</math> in methylamine solution at <math>T = 298.15 \text{ K}</math></p> <p><b>Table IV.4.</b> The ion-pair <math>K_P</math>, and triple-ion <math>K_T</math> formation constant respectively corresponding to the minimum salt concentration (<math>c_{\min}</math>) for <math>[\text{Bu}_4\text{PCH}_3\text{SO}_3]</math> in methylamine solution at <math>T = 298.15 \text{ K}</math></p> <p><b>Table IV.5.</b> Salt concentration (<math>c_{\min}</math>) at the minimum conductivity (<math>\Lambda_{\min}</math>), the ion-pair fraction (<math>\alpha</math>), triple-ion fraction (<math>\alpha_T</math>), ion-pair concentration (<math>C_P</math>) and triple-ion concentration (<math>C_T</math>) of <math>[\text{Bu}_4\text{PCH}_3\text{SO}_3]</math> in methylamine solution at <math>T = 298.15 \text{ K}</math></p> <p><b>Table IV.6.</b> Interionic distance parameter for ion-pair (<math>a_{IP}</math>) and for triple-ion (<math>a_{TI}</math>) in methylamine solution at <math>T = 298.15 \text{ K}</math></p> <p><b>Table IV.7.</b> Stretching frequency of the functional group of methylamine solution and change of frequency in addition of <math>[\text{Bu}_4\text{PCH}_3\text{SO}_3]</math></p>	<b>103-105</b>

- Table V.1** Density ( $\rho_0$ ), Viscosity ( $\eta$ ), refractive index ( $n_D$ ) of aqueous acetonitrile solutions
- Table V.2** Density, Viscosity, Refractive index of [25 %H<sub>2</sub>O + 75% CH<sub>3</sub>CN] solvent mixture at 25°C
- Table V.3** Density, Viscosity, Refractive index of [50 %H<sub>2</sub>O + 50% CH<sub>3</sub>CN] solvent mixture at 25°C
- Table V.4** Density, Viscosity, Refractive index of [75 %H<sub>2</sub>O + 25% CH<sub>3</sub>CN] solvent mixture at 25°C
- Table V.5** Experimental value of apparent molar volume  $\phi_V$  for CH<sub>3</sub>COOLi in binary solvent mixtures of H<sub>2</sub>O ( $w_1$ ) + CH<sub>3</sub>CN ( $w_2$ ) at 298.15 K
- Table V.6** Experimental value of apparent molar volume  $\phi_V$  for LiNO<sub>3</sub> in binary solvent mixtures of H<sub>2</sub>O ( $w_1$ ) + CH<sub>3</sub>CN ( $w_2$ ) at 298.15 K
- Table V.7** Experimental value of apparent molar volume  $\phi_V$  for LiI in binary solvent mixtures of H<sub>2</sub>O ( $w_1$ ) + CH<sub>3</sub>CN ( $w_2$ ) at 298.15 K
- Table V.8** Limiting apparent molar volumes  $\phi_V^0$ , experimental slopes  $S_V^*$ , A, B-coefficients for lithium salts in binary solvent mixtures of H<sub>2</sub>O ( $w_1$ ) + CH<sub>3</sub>CN ( $w_2$ ) at 298.15 K
- Table V.9** Experimental value of apparent molar volume  $(\eta_r - 1)/\sqrt{c}$  for CH<sub>3</sub>COOLi in binary solvent mixtures of H<sub>2</sub>O ( $w_1$ ) + CH<sub>3</sub>CN ( $w_2$ ) at 298.15 K.
- Table V.10** Experimental value of apparent molar volume  $(\eta_r - 1)/\sqrt{c}$  for LiNO<sub>3</sub> in binary solvent mixtures of H<sub>2</sub>O ( $w_1$ ) + CH<sub>3</sub>CN ( $w_2$ ) at 298.15 K.
- Table V.11** Experimental value of apparent molar volume  $(\eta_r - 1)/\sqrt{c}$  for LiI in binary solvent mixtures of H<sub>2</sub>O ( $w_1$ ) + CH<sub>3</sub>CN ( $w_2$ ) at 298.15 K.

	<p><b>Table V.12</b> The equivalent conductance (<math>\Lambda</math>), the corresponding concentration <math>c</math>, for lithium salts in binary solvent mixture of [25%<math>H_2O</math> + 75% <math>CH_3CN</math>], [50%<math>H_2O</math> + 50% <math>CH_3CN</math>] and [50%<math>H_2O</math> + 50% <math>CH_3CN</math>] at 298.15 K</p> <p><b>Table V.13</b> Calculated limiting ionic conductance at different concentrations of the solvent mixture at 298.15K</p>	
<b>Chapter VI</b>	<p><b>Table VI.1.</b> Chemical name, CAS number, the mass fraction of purity and water content of the chemicals used</p> <p><b>Table VI.2.</b> Density (<math>\rho</math>), refractive index (<math>n_D</math>) and speed of sound (<math>u</math>) of ionic liquid (<math>x_{AlCl_3}=0.62</math>) and pure solvents at <math>T = 293.15K</math> to <math>318.15K</math> and at atmospheric pressure<sup>a</sup></p> <p><b>Table VI.3.</b> Limiting apparent molar volume, <math>\phi_V^o</math>, coefficients (<math>S_V</math> and <math>B_V</math>), molar refraction (<math>R_M</math>), apparent molar isentropic compressibility (<math>\phi_K^o</math>), coefficients (<math>S_K</math> and <math>B_K</math>) of ionic liquid <math>[emimCl]_2[AlCl_3]_3</math> (<math>x_{AlCl_3}=0.62</math>) in solvents at <math>T = 293.15K</math> to <math>318.15K</math> and at atmospheric pressure<sup>a</sup></p> <p><b>Table VI.4.</b> Empirical coefficient (<math>a_0, a_1, a_2</math>) of equation 3, <math>(\partial\phi_E^o/\partial T)_p</math> for ionic liquid in chosen solvents</p> <p><b>Table VI.5.</b> Limiting apparent molar expansibility (<math>\phi_E^o</math>), <math>\sigma(\phi_E^o)</math>, ionic limiting apparent molar volume (<math>\phi_{V(io)}^o</math>) solvated volume including ions (<math>r_s</math>) polarizability (<math>\alpha</math>), solvated volume by solvents (<math>\phi_{V(so)}^o</math>) in methanol, ethanol, 1-propanol, and 1-butanol</p>	<b>143-147</b>
<b>Chapter VII</b>	<p><b>Table VII.1.</b> Association Constants of 4C1N+<math>\alpha</math>-CD and 4C1N+<math>\beta</math>-CD complexes</p> <p><b>TableVII. 2.</b> Thermodynamic parameters of 4C1N+<math>\alpha</math>-CD and 4C1N+<math>\beta</math>-CD</p>	<b>166-167</b>

	<p><b>Table VII.3.</b> Chemical shifts (<math>\delta</math>/ppm) of protons of cyclodextrins after complex formation</p> <p><b>Table VII.4.</b> Chemical shifts (<math>\delta</math>/ppm) of protons of 4C1N after complex formation</p> <p><b>Table VII.5.</b> Mass spectral data</p>	
<b>Chapter VIII</b>	<p><b>Table VIII.1.</b> Thermodynamic parameters computed from surface tension and uv spectroscopy</p> <p><b>Table VIII.2.</b> Chemical shifts (<math>\delta</math>/ppm) of protons of <math>\beta</math>-Cyclodextrin after complex formation</p>	<b>189</b>
<b>Chapter IX</b>	<p><b>Table IX.1.</b> Association Constant and change in free energy for the (DMPD+<math>\beta</math>-CD) complex</p>	<b>207</b>

## LIST OF FIGURES

CHAPTERS	FIGURES	PAGE NO.
<b>Chapter IV</b>	<p><b>Figure IV.1.</b> Plot of molar conductance (<math>\Lambda</math>) and the square root of molar concentration (<math>\sqrt{c}</math>) of <math>[\text{Bu}_4\text{PCH}_3\text{SO}_3]</math> in methylamine solution at <math>T = 298.15\text{K}</math></p> <p><b>Figure IV.2.</b> Stretching frequency of N-H in methylamine solution (black solid line) and in <math>\{[\text{Bu}_4\text{PMS}]+\text{CH}_3\text{NH}_2</math> solution} (red solid line) respectively</p>	<b>106</b>
<b>Chapter V</b>	<p><b>Figure V.1.</b> Three dimensional representations of the salts and the mixture of binary solvents used in the work</p> <p><b>Figure V.2.</b> Diagrammatic representation of the solvation sphere.</p> <p><b>Figure V.3.</b> Plot of apparent molar volume with respect to concentrations at 298.15K [yellow line for LiI, blue line for <math>\text{LiNO}_3</math>, green line for <math>\text{CH}_3\text{COOLi}</math>]</p> <p><b>Figure V.4.</b> Plot of limiting apparent molar volume with respect to mass fractions of the binary solvent mixture at 298.15K [red symbol for <math>\text{CH}_3\text{COOLi}</math>, green symbol for <math>\text{LiNO}_3</math>, sky symbol for LiI]</p> <p><b>Figure V.5.</b> Plot of Viscosity B-coefficient of Lithium salts verses the mass fractions of the solvent mixture at 298.15K [orange symbol points <math>\text{CH}_3\text{COOLi}</math>, purple symbol points <math>\text{LiNO}_3</math>, yellow symbol points LiI].</p> <p><b>Figure V.6.</b> Plot of limiting molar refraction (<math>R_M^0</math>) vs mass fraction for Lithium salts <math>\text{CH}_3\text{COOLi}</math> (blue), <math>\text{LiNO}_3</math> (brown), LiI (green) in aqueous acetonitrile.</p>	<b>126-129</b>

	<p><b>Figure V.7.</b> Plot of equivalent conductance versus concentration of lithium salts at 298.15K [red triangles for CH<sub>3</sub>COOLi, green squares for LiNO<sub>3</sub>, and blue small squares for LiI].</p> <p><b>Figure V.8.</b> Plot of Fluorescence intensity against wave length of lithium salts at 298.15K [green squares for LiI, red triangles for LiNO<sub>3</sub>, and blue small squares for CH<sub>3</sub>COOLi]</p>	
<p><b>Chapter VI</b></p>	<p><b>Figure VI.1.</b> A plot of apparent molar volume (<math>\phi_v</math>) of ionic liquid (1-ethyl-3-methylimidazolium chloride-aluminum chloride) with a corresponding concentration in methanol (1a), ethanol (1b), 1-propanol (1c), and 1-butanol (1d), at <math>T=293.15\text{K}-318.15\text{K}</math> and atmospheric pressure</p> <p><b>Figure VI.2.</b> Plot of molar refraction (<math>R_M</math>) of ionic liquid ([EMIm]Cl/AlCl<sub>3</sub>) vs concentration for (2a) methanol, (2b) ethanol, (2c) 1-propanol, and (2d) 1-butanol, at different temperature and at atmospheric pressure</p> <p><b>Figure VI.3.</b> Plot of apparent molar isentropic compressibility (<math>\phi_\kappa</math>) of ionic liquid ([EMIm]Cl/AlCl<sub>3</sub>) vs concentration for methanol (<math>\blacklozenge</math>), ethanol (<math>\blacksquare</math>), 1-propanol (<math>\blacktriangle</math>), and 1-butanol (<math>\times</math>), at 293.15K (3a), 298.15K (3b), 303.15K (3c), 308.15K (3d), 313.15K (3e), 318.15K (3f) and at atmospheric pressure.</p> <p><b>Fig S1.</b> Plot of apparent molar volume (<math>\phi_v</math>) of ionic liquid ([EMIm]Cl/AlCl<sub>3</sub>) vs concentration for methanol (<math>\blacklozenge</math>), ethanol (<math>\blacksquare</math>), 1-propanol (<math>\blacktriangle</math>), and 1-butanol (<math>\times</math>), at different temperature and atmospheric pressure</p> <p><b>Fig S2.</b> Plot of isentropic compressibility (<math>\beta_s</math>) of ionic liquid ([EMIm]Cl/AlCl<sub>3</sub>) vs concentration for methanol (S2a), ethanol (S2b), 1-propanol (S2c), and 1-butanol (S2d), at different temperature and atmospheric pressure</p>	<p><b>148-151</b></p>



	<b>Fig S3.</b> Plot of apparent molar isentropic compressibility ( $\phi_k$ ) of ionic liquid ([EMIm]Cl/AlCl <sub>3</sub> ) vs concentration for methanol (S3a), ethanol (S3b), 1-propanol (S3c), and 1-butanol (S3d), at different temperature and atmospheric pressure	
<b>Chapter VII</b>	<p><b>Figure VII.1.</b> Variations in the surface tension (<math>\gamma</math>) of 4C1N in aqueous ethanol with increasing concentration of (a) <math>\alpha</math>-CD and (b) <math>\beta</math>-CD at 298.15K</p> <p><b>Figure VII.2.</b> Job plots of (a) [4C1N]+<math>\alpha</math>-CD and (b) [4C1N]+<math>\beta</math>-CD</p> <p><b>Figure VII.3.</b> <sup>1</sup>H NMR spectra of IC1, <math>\alpha</math>-CD and 4C1N at 298.15 K</p> <p><b>Figure VII.4.</b> <sup>1</sup>H NMR spectra of IC2, <math>\beta</math>-CD and 4C1N at 298.15 K</p> <p><b>Figure 5.</b> FT-IR spectra of 4C1N, <math>\alpha</math>-CD and the solid complex (IC1)</p> <p><b>Figure VII.6.</b> FT-IR spectra of 4C1N, <math>\beta</math>-CD and the solid complex (IC2)</p> <p><b>Figure VII.7.</b> HRMS spectra of (4C1N+<math>\alpha</math>-CD) inclusion complex</p> <p><b>Figure VII.8.</b> HRMS spectra of (4C1N+<math>\beta</math>-CD) inclusion complexes</p> <p><b>Figure VII.9.</b> Scanning electron photograph for (a) 4C1N (b) <math>\alpha</math>-CD (c) <math>\beta</math>-CD (d) 4C1N+<math>\alpha</math>-CD and (e) 4C1N+<math>\beta</math>-CD</p>	<b>168-173</b>
<b>Chapter VIII</b>	<p><b>Figure VIII.1.</b> Plot of surface tension of hydrazinophthalazine as a function of <math>\beta</math>CD concentration</p> <p><b>Figure VIII.2.</b> Plot of <math>C_0/(\gamma-\gamma_0)</math> of hydrazine-phthalazine against concentration of <math>\beta</math>CD (<math>C^{-n}</math>; n=1 or 2)</p>	<b>190-193</b>

	<p><b>Figure VIII.3.</b> Jobs plot of hydrazinophthalazine + <math>\beta</math>CD</p> <p><b>Figure VIII.4.</b> Absorption spectra of hydrazinophthalazine in presence and absence of <math>\beta</math>CD</p> <p><b>Figure VIII.5.</b> Double reciprocal plot of <math>\frac{1}{\Delta A}</math> vs <math>\frac{1}{[\beta C]}</math></p> <p><b>Figure VIII.6.</b> Plot of specific conductivity (<math>\kappa</math>) corresponding to conc. of <math>\beta</math>-CD.</p> <p><b>Figure VIII.7.</b> <math>^1\text{HNMR}</math> spectra of complex, <math>\beta</math>-CD, and pure hydrazinophthalazine in <math>\text{D}_2\text{O}</math> respectively</p> <p><b>Figure VIII.8.</b> SEM picture of hydrazinophthalazine, <math>\beta</math>-CD, and inclusion complex respectively</p>	
<p><b>Chapter IX</b></p>	<p><b>Figure IX.1.</b> Variation of specific conductivity (<math>\kappa</math>) and surface tension (<math>\gamma</math>) of DMPD with concentration of <math>\beta</math>-CD</p> <p><b>Figure IX.2.</b> Job's plot of DMPD with <math>\beta</math>-CD</p> <p><b>Figure IX.3.</b> UV-vis spectral changes on addition of <math>\beta</math>-CD</p> <p><b>Figure IX.4.</b> Linear plot of <math>1/\Delta A</math> vs <math>1/[\beta\text{-CD}]</math> for DMPD+<math>\beta</math>-CD system</p> <p><b>Figure IX.5.</b> <math>^1\text{HNMR}</math> spectra of pure (a) DMPD, (b) <math>\beta</math>-CD and (c) inclusion complex between DMPD and <math>\beta</math>-CD (in <math>\text{D}_2\text{O}</math>, 400 MHz)</p> <p><b>Figure IX.6.</b> 2D ROESY spectra of the solid inclusion complex of DMPD and <math>\beta</math>-CD</p> <p><b>Figure IX.7.</b> Scanning electron photograph for (a) DMPD, (b) <math>\beta</math>-CD, (d) (DMPD+<math>\beta</math>-CD) inclusion complex</p>	<p><b>207-210</b></p>

## LIST OF SCHEMES

CHAPTERS	SCHEMES	PAGE NO.
<b>Chapter IV</b>	<p><b>Scheme IV.1.</b> The pictographic representation of triple-ion formations for the studied ionic liquid, as an example in methylamine solution</p> <p><b>Scheme IV.2.</b> The probable schematic representation of the interaction (ion-dipole, H-bond interaction) between ions of ionic liquid and methylamine molecule in solution system</p>	<b>107-108</b>
<b>Chapter V</b>	<p><b>Scheme IV.1</b> Diagrammatic representation of the ion-solvent interaction</p>	<b>130</b>
<b>Chapter VI</b>	<p><b>Scheme VI.1.</b></p> <p>Plausible inter-ion interaction of ionic liquid([EMIm]Cl/AlCl<sub>3</sub>)</p> <p><b>Scheme VI.2.</b></p> <p>Plausible form of Hydrogen bonding of ionic liquid [EMIm]Cl/AlCl<sub>3</sub> with methanol</p>	<b>151</b>
<b>Chapter VII</b>	<p><b>Scheme VII.1.</b> molecular structure of <math>\alpha</math>- CD, <math>\beta</math>-CD and 4-chloro-1-naphthol</p> <p><b>Scheme VII2.</b> Various hydrogen atoms in cyclodextrin molecule</p> <p><b>Scheme VII.3.</b> 4-chloro-1-naphthol+Cyclodextrin 1:1 inclusion complex</p>	<b>174</b>

<p><b>Chapter VIII</b></p>	<p><b>Scheme VIII.1.</b> Schematic representation of inclusion complex between the hydrazinophthalazine and <math>\beta</math>CD in aqueous media</p> <p><b>Scheme VIII.2.</b> Schematic representation of 1:1 inclusion complex</p> <p><b>Scheme VIII.3.</b> Interior and exterior proton of <math>\beta</math>-cyclodextrin</p>	<p><b>194-195</b></p>
<p><b>Chapter IX</b></p>	<p><b>Scheme IX.1.</b> Molecular structure of <math>\beta</math>-CD and DMPD</p> <p><b>Scheme IX.2.</b> Molecular structure of <math>\beta</math>-Cyclodextrin molecule with interior and exterior protons</p> <p><b>Scheme IX.3.</b> Plausible mechanism of the inclusion complexation</p> <p><b>Scheme IX.4</b> Probable host:guest stoichiometric ratio of the inclusion complexes</p>	<p><b>211-212</b></p>

## APPENDIX A

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### LIST OF PUBLICATIONS

1. Exploration of Non-Covalent Interactions of Lithium Salts in Acetonitrile Water Binaries with the Manifestation of Solvation Consequences.



*International Journal of Research in Chemistry and Environment* 9 (2018) 2248-9649

*Included in the Thesis*

2. Conductance and FTIR Spectroscopic Study of Triple ion Formation of Tetrabutylphosphonium Methanesulfonate in Methylamine Solution.



*Chemical Methodologies* 4 (2020) 55-67

*Included in the Thesis*

3. Minimization of the Dosage of Food Preservatives Mixing with Ionic Liquids for Controlling Risky Effect in Human Body: Physicochemical, Antimicrobial and computational study.



*Journal of Molecular Liquids* 282 (2019) 415-427

4. Inclusion of Hydrazinophthalazine Insight into the Cavity of  $\beta$ -Cyclodextrin: a Study of Surface Tension and UV-VIS Spectroscopy.



***Asian Journal of Green Chemistry 5 (2021) 183-195***

***Included in the Thesis***

5. Non-Covalent Interaction Between Ionic Liquid (1-Ethyl-3-Methylimidazolium Chloride-Aluminum Chloride) and Pure Alcohols.



***Current Physical Chemistry***

***DOI: 10.2174/1877946811666210623163554***

***Included in the Thesis***

6. Synthesis and Characterization of an Industrially Significant Ionic Liquid and its Inclusion Complex with  $\beta$ -Cyclodextrin and its Soluble Derivative for their Advanced Applications.



***Chemical Physics Letters 769 (2021) 138401***



### List of Seminar/Conference/Workshop attended

- ❖ 20<sup>th</sup> CRSI NATIONAL SYMPOSIUM IN CHEMISTRY, 3<sup>rd</sup>-5<sup>th</sup> Feb2017, Organised by : Department of Chemistry, Gauhati University (Presented a poster)
- ❖ International Seminar on “Frontiers in Chemistry-2018”, Organised by: Department of Chemistry, University of North Bengal & CRSI North Bengal Local Chapter (Presented a poster)
- ❖ National Seminar on “Frontiers in Chemistry-2019”, Funded by: UGC and SAP (DRS-III), Organised by: Department of Chemistry, University of North Bengal & CRSI North Bengal Local Chapter
- ❖ National Seminar on “Frontiers in Chemistry-2020”, Organised by: Department of Chemistry, University of North Bengal (Presented a poster)