ACKNOWLEDGEMENT

At this moment of accomplishment first of all I pay my homage and heartfelt gratitude to my mentors **Prof.** NiraMisra and **Prof.** Biswajit Ray for their throughout guidance, continuous support and encouragement since the start of this endeavor. It would have been nearly impossible and a cumbersome job to accomplish the work without them who blessed me with their exquisite attributes and unparallel creative as well as scientific traits and guided affectionately and compassionately all through the doctorial period for which I shall have no words to express. Whatever, I have achieved in my starting carrier is the sole brainchild of my supervisors who instilled in me confidence of executing the plan of work efficiently and focusing on the desired objective and infused in me blood of research. Their scientific temper and zeal has enthused me to carry out any sort of work efficiently and productively.

On the personal front, my madam has all the human traits, humbleness, leadership qualities, cooperativeness, absolving nature and beneficial attitude has vested me with the power of standing tall and boasted. I feel proud to say about my sir, his human nature, magnanimity, generosity and qualities which are matched to the second none. He is a human being par excellence and shall remain a cherished ideal not only for me but others who will strive to follow his generous and cordial personality.

I feel proud in expressing my profound gratitude to the coordinator Prof. A. K. Ray for providing the necessary amenities and giving me the opportunity to work such a competitive environment. I extend my sincere gratitude Prof. Ranjana Patnaik, Dr. N. Sharma, Dr. S. K. Rai, Dr. S. Sharma, Dr. S. B. Dasgupta and Dr. S. K. Mahto for their excellent support and constant encouragement during this dissertation work.

I am extremely grateful to Prof. S. K. Sengupta (Ex Head and Dean), Prof. V. B. Singh, Head, Department of Chemistry, BHU, for providing me the departmental facilities during my research period.

I express my heartfelt thanks to office staff of School specially Mr. Parmathma, Mr. Sharma, Mr. Barth, Mr. Mishra, Mr. Rajesh, Mr. Ajay, Mr. Sharan, Mr. Kishori and Mr. Srivastava.

I am also thankful to the technical and office staff of the Department of Chemistry for taking care of all the official things. I also like to thank all library staffs for providing easy access to library books and journals.

I owe my personal thanks to Dr. P. P. Manna, Dept. of Zoology, Faculty of science, BHU for performing in Biological studies. I am indebted to Prof. P. Maiti, School Material Science and Engineering, IIT (BHU) for performing TGA and DSC studies and prof. M. V. Jagannadham, Dept. Molecular Biology, IMS, BHU for performing Antibacterial studies. I am highly obliged to Prof. T. K. Mandal, (IACS), Kolkata performing DLS and Dr. D. Chatterjee, (CU), Kolkata, for performing DLS and TEM. I express special thanks to Dr. M. Yashpal (IMS, BHU) for providing TEM facility and Dr. Ida Tiwari, Dept. Chemistry, BHU for performing Fluorescence spectroscopy, and Dr. S. Saha, for providing me temperature dependent UV-vis spectroscopy.

I heartily acknowledge the invaluable cooperation and timely suggestions of my seniors and colleagues Dr. A. K. Mishra, Dr. N. K. Vishwakarma, Dr. V. K. Patel, Dr. C. S. Biswas, Dr. R. Kumar, Dr. S. Hira, Dr. J. Yadav, Dr. S. Rao, Dr. G. Kapusetti, Dr. S. Jaiswal, Mr. S. Kumar, Mr. R. Reddy, Mr. A. Venkanna, Mr. D. K. Kumar, Dr. P. Rao, Mr. R. Kosaru, Mrs. Monika, Mr. K. Mitra, Mrs. S. Singh, Mr. B. K. Vignesh, Mr. Koushal, Ms. R. Singh, Ms. A. Kumari, Mr. S. Viswakarma, Mr. J. Singh and apart from this I am thankful to all the fellow members of the Research Labs for providing me a conducive environment to carry out my research work.

I am very thankful to my friends Mr. Y. Rajasekhar, Mr. T. Kranthi Kumar, Mr. Karan Madavi, Mr. Siva Chinna, Mr. P. Hemanth, Mr. R. Sravan, Mr. Manjeet, Mr. Vinod, Mr. Santhosh Mr. T. Satish, Mr. P. Naresh, Mr. Raghu and Mr. Jagadish for fruitfully discussions, good company and maintaining a constructive research environment.

I cannot find words to express my earnest thanks to my childhood friends Mr. Ranjith Kumar, Mr. Rajkumar they always wishes me to achieve success and gain heights and took every single effort either in words or in action to push me forward.

My Acknowledgement will remain incomplete without recognizing admirable support of Mr. Koushik, Mr. Sanjay Saxena, Mr. Nishanth, Ms. Anuranjitha, Mr. Ankit, Mr. Chandan Kumar, Mr. Jitendra and Ms. Hemlatha.

I would like to acknowledge, Ministry of Human Resource Development (MHRD), India for providing me teaching assistance ship (TA).

The people, who instilled inspiring in my life are those who bought me up, nurtured and imparted me the real virtues of humanities, empathy and kindness. They are my real motivators who sacrifice in order to bring me to the present position and blessed me with their grace and affection. These people are none other than my beloved parents Sri K. Shivaram Patil and Smt. Sheshabai, I pay my sincerest obeisance to them. I am invariably full short of words for the support and encouragement rendered by my brothers Maruthi Rao, Anand Rao, Venkat Rao and Chandrakanth Rao, sister in laws Sabitha, Aswini, Kavitha and Sneha.

I would like to thank everybody who is important directly or indirectly towards my research carrier in BHU, as well as expressing my apology if I could not mention the contributors personally.

Last, but not least, my head bows in paying obeisance to **God Almighty Sai** baba and Lord Viswanath who always bestowed upon me their kind blessing and showed me the path of right virtues.

K. Ramesh