Acknowledgements

A journey is easier when you travel together. Interdependence is certainly more valuable than independence. Research is a constant process and is an endless duty for a researcher. This thesis is the combined result of my research work and people who have been supporting me in this endeavour. It is a pleasant opportunity for me to express my gratitude for all of them.

In completion of this Herculean task, with a deep sense of gratitude, the first person I will ever remember is my research guide, Prof. (Mrs.) R. S. Bendre. The work has been achieved because of her kindness, constructive criticism and patience. Her enthusiasm, integral view on research and mission of providing support throughout the work has made a deep impression on me. Her comments have always guided me and made me more systematic and more hardworking. It is impossible to express greatness of her in few words.

I am equally thankful to Prof. Sudhir U. Meshram, Hon’ble Vice-Chancellor, Dr. A. M. Mahajan, Registrar and Prof. D. G. Hudiwale, Director, BCUD, North Maharashtra University, Jalgaon for giving me an opportunity to work at the Institute.

I am again grateful to Prof. P. P. Mahulikar, Director, School of Chemical Sciences, North Maharashtra University, Jalgaon for giving me an opportunity to work at the university school and providing the basic infrastructure essential for my research work.

I can never fulfill completeness of my thesis without the valuable suggestions and support from Prof. K. J. Patil, Prof. S. L. Patil, Prof. A. U. Borse, Prof. J. S. Meshram, Prof. D. H. More, Dr. V. V. Gite, Dr. D. S. Dalal, Dr. S. S. Terdale and Dr. K. K. Sharma. In my research tenure I am fortunate to have such kind of personalities who have created enthusiasm towards research.

I also wish to thank Prof. V. L. Maheshwari, Director, School of Life Sciences, North Maharashtra University, Jalgaon for providing PTC facility in their school, Mr. K. S. Vishwakarma and Mr. M. Shahid for their kind cooperation in PTC work.

My thanks to University Grants Commission, New Delhi, Government of India, for providing the Project and RFSMS- fellowship, Indian Council of Chemist for ICC- fellowship and also very much thankful to Department of Science and Technology, New Delhi, Government of India, for providing the “INSPIRE Fellowship” during my research work.

I am thankful to our supporting non-teaching staff Dr. N. B. Patil, Mr. A. A. Shimpi, Mr. A. Y. Aarak, Mr. P. K. Patil, Mr. L. Tadvi, Ms. Veena, Ms. Shinde, Mr. Shashikant, Mr. Rahul and others for their cooperation during the work.
My wholehearted thanks are due to all my past and present lab mates Dr. Chetan Zade, Mr. Jitendra Bhosale, Mr. Umesh Pete, Mr. Chakradhar Hadole, Mr. Jayawant Shinde, Ms. Smita Patil, Ms. Samina Tadavi, Mr. Shashikant Pawar, Mr. Pravin Karandikar, Mr. Dyaneshwar Ahire, Dr. Rakesh Sancheti, Dr. Anil Kuwar, Mr. Jayesh Gujarathi, Mrs. Archana and Dr. Sawale for their support during my research tenure.

I would never forget the company I had of my fellow research scholars and friends. In particular, I am thankful to Dr. S. M. Bharambe, Dr. Y. A. Pawar, Dr. P. S. Nagle, Mr. P. P. Patil, Dr. A. E. Sonawane, Dr. A. P. Nikum, Dr. U. D. Patil, Mr. V. Shaikh and Mr. A. Ahamad for their cheerful atmosphere, which made my journey in the school easier. I am also grateful to Dr. R. P. Gore, Dr. Bhole, Mr. V. V. Patil, Mr. Sandip N. Patil and Pankaj Gavit for their suggestions.

I wish to thank my other research colleagues, Mr. Rahul Mahire, Nilesh Patil, Mahesh Patil, Sandip Patil, Ajay Kshirsagar, Avinash Bagale, Yogesh Wagh, Yogesh Tayade, Kundan Tayade, Ms. Rupali Patil, Ms. Dipika, Mr. Mukesh Deshmukh, Abhijeet Anand, Ravi Marathe, Piyush Tatiya, Rahul Hedaoo, Ashok Chaudhari, Mahendra Nevare, Sandip Rajput, Vilas Mahire, Chandrashekhar, Rahul, Shivkumar and others from School of Chemical Sciences and University campus for their help and constant support.

Words are not enough to thank my Father and Mother for educating me with aspects of sciences, for their unconditional love, trust, constant support and encouragement to pursue my interests. I wish to thank my Brother Yogesh, Dhanraj, Manohar; Sarala vahini, Nalini vahini and chillar party; Janhavi, Abhishek, Aniruddha & Ishant for their support, understanding, love & ethics, which taught me the value of hard work and rendered me enormous support during the whole tenure of my research work.

I express thanks to my wife Mrs. Ashwini for her peaceful and moral support. She has been involved with each and every situation in my life.

I express very much thanks to my tender daughter “Harita”, I would like to admire her passion.

I thank all who are knowingly and unknowingly involved and offered cooperation for this work.

Mr. Dipesh Pandurang Mahajan
Research Student