ACKNOLEDGEMENT

It gives me immense pleasure in being able to submit this Ph. D. thesis. I would like to express my countless gratitude to “God” who gave me the inspiration, health and strength throughout the pursuit of studies to achieve a long cherished dream.

It needs not to be stressed that the combined efforts of both the teacher and student are indispensable for achieving success in his case. For the teacher it requires patience, devotion, perseverance and the student requires sincerity and hard work to sum up. It is with the deep sense of gratitude and high respect that I acknowledge the most valuable guidance and encouragement given by Dr. Sunil Ramrao Mirgane, Associate Professor, P. G. Department of Chemistry, Jalna Education Society’s R. G. Bagdia Arts, S. B. Lakhotia Commerce, R. Bezonji Science College, Jalna during the course of this work. He explained the toughest part subject matter, which made me to understand the field of physical properties and assured a very happy completion. He has been more than a research guide to me.

I am indebted to respected Prof. B. R. Arbad, Head, Department of Chemistry, Dr. Babasaheb Ambedkar Marathwada University, Aurangabad for his valuable guidance, worthy suggestions, stimulating discussions, keen interest and inspiration at each and every stage of research work.

I am thankful to chairman, Shri. Puroshhattamseth Bagdia, Secretary, Shri Shrinivasji Bhhakad and management of Jalna Education Society, for the inspiration to carry out this dissertation.

I also wish to pay my sincere thanks to Principal Dr. R. S. Agrawal, former head Dr. S. M. Deshpande and present head of department of chemistry Dr. P. G. Mundhe of J. E. S. College, Jalna for granting me permission to undertake this work, for allowing to submit this work in the form of thesis and their constant encouragement throughout this work.

I wish to express my sincere thanks to Vice-Principals, S.K. Popalghat, R.V. Arbad and Supervisor of my college, B.A. Kasat.

I am also thankful to faculty members of department of chemistry, J. E. S. college, Jalna for their co-operation and constant encouragement specially
Dr. B. R. Agrawal, Dr. D. M. Janrav, Shri. A. U. Khandebharad, Manoj More,
Shri. S. R. Sadavarte, Shri. V. K. Pagare, Dr. S. B. Bikkad, Shri. M. G. Soni, Dr.
S. R. Sarda and Shri. M. M. Malode for their support.

I will be failing in my duty if do not record my appreciation and heart-
felt thanks to my research colleagues, Dr. A. A. Sakalgaoankar, Dr. G. R.
Bhagure, Dr. A. V. Gaikwad, Dr. S. S. Patil, Shri. J. D. Kale, Shri. Vilas Khade,
Shri. R. V. Ambhure, Shri. D. U. Thombal and Shri. Gopal Khedekar for
providing pleasant and encouraging atmosphere to research work.

I would like to take this opportunity to thanks my teachers Dr. Mehdi
Hasan, Head department of chemistry, M. S. G. College, Malegaon camp,
Principal Dr. D. F. Shirude, Arts, Science and Commerce College Nampure,
Principal Dr. B. S. Jagdale, Panchavati College, Nasik, Dr. A. B. Sawant, Dr. V.
V. Khanna and Dr. R. P. Shewale for kind inspiration and valuable guidance.

I wish to express my sincere thanks to my friends, R. K. Thombre,
R.R.Bhosale, Dr. L. V. Shinde, Dr. F. M. Mohite, V.B. Gaud, Dr. S. J. Bhavsar,
Dr. J.D.Kabra, S M. Tathe, Dr. S. D. Niture, P. B. Choure, T. R. Jagtap, S. V.
Wasre, Dr. R. S. Sonawne, V. V. Ambarwadikar, G.V. Jagtap, C.B. Deshpande, P.
C. Bafna, V.S. Jadhav, Dr. Y.S. Sonune, Dr. U.P. Mogle, Dr. H.C. Choudhari,
Dr. C.S. Mahajan, Dr. N.Y. Gore, Sami Siddique, B.S. Salunkhe, A. B. Gawand, J.
V. Ulaswar, V. N. Bachhav, S. B. Shinde, S. B. Patil, S. S. Ghodke, Vinod Wagh,
Narendra Dhokhe, N. M. Kadam and college colleagues for their constant
encouragement throughout the work.

I offer my sincere thanks to Sau. Sunitatai Mirgane, Chi. Saurabh and
Chi. Siddhant for their kind care and homely atmosphere during this work.

A special mention must be made of thanks to Dr. Sushant Deshmukh
and Vijay Shinde for helping in computer programming and experimental
setup.

I also thankful to Manoj Mane and Dattatary Devlankar, National
Chemical Laboratory, for helping me in referencing during this research work.

Many thanks also go to non-teaching staff Shri. S. V. Kamble, Shri. D.
B. Gullapelli, Shri. S. F. Rathod, Shri. B. P. Phadat, Shri. A. K. Zine, Shri. D. N.
Karad, Shri. J. A. Athawale and Shri. U. B. Bhalerao for their valuable help in
carrying out this work.
I have no words to express how grateful I am to my father Shri. Rameshrao and mother Sau. Sumanbai for their constant encouragement with love. I would like to express my special appreciation for S.R.Chavan saheb, L. P. Malisaheb, S. F. Mahajan, Subhashrao Mahajan, Sangitatai Mahajan, Rajendra Mahajan, Vaishalitai Mahajan, S. G. Jadhav, C. K. Mali, Rajendra Rokade, Prashant Bhadane, Chetan Borse, Vaibhav Khalane, Deepali Bhadane, Rakhi Borse, Abhishekh Mahajan, Ankita Mahajan and Sudhakar Bacchhav for their love and encouragement.

A special mention must be made of thanks to my life partner Sau. Savita for her patience and understanding and who always boosted my moral at every stage of this work.

I must express the deep sense of joy and happiness created by my daughter Anushri and niece Bhairavi. Her sweet presence and silky touch gives me inspiration to carry out this dissertation.

I am thankful to all my colleagues and friends who have always motivated and inculcated encouragement throughout my research work. I also take this opportunity to express my sincere regards and gratitude to all my family members for their blessings and affection without which this work would never been completed.

My unstinted thanks to all my well-wishers not mentioned above, but whose good wishes and persuasions enabled me to carry this dissertation.

The thesis work has taught me immense patience and perseverance. Apart from completion of this dissertation the journey has been a real award for me.

Mahajan Aravind Rameshrao

May: 2013