Acknowledgements

I take this opportunity to express my profound sense of gratitude and respect to all my loved ones, who helped me through the duration of this thesis.

At the outset, I thank God, the merciful and the passionate, who bestowed blessings, diligence and strength in me to complete this research work.

I would like to express my deep and sincere gratitude to my Ph.D supervisor Dr. Hiren B. Soni, Assistant Professor, P.G. Department of Environmental Science and Technology, ISTAR, who guided me throughout to start this work on such an innovative topic. Without his valuable guidance, generous support, and enthusiasm with which he solved my difficulties, this research would never been completed.

It is my privilege to express a deep sense of gratitude towards UGC (University Grants Commission, New Delhi), for granting me a Maulana Azad National Fellowship (MANF), thus making it possible to balance my financial resources.

I am extremely grateful to Dr. C.L. Patel, Chairman, Charutar Vidya Mandal (CVM), for giving me the opportunity to carry out my research in his esteemed organizations Sophisticated Instrumentation Centre for Applied Research and Testing (SICART) and Institute of Science and Technology for Advanced Studies and Research (ISTAR).

I owe with humility my indebtedness to Late Dr. V.S. Patel, Director, SICART, Vallabhbh Vidyanagar and Dr. J.H. Patel (I/c Ex-Director, ISTAR), who encouraged me and gave valuable suggestions. I am also highly thankful to Dr. P.M. Udani, Director, ISTAR, Vallabhbh Vidyanagar, for his blessings and time to time guidance regarding the subject. I owe my sincere thanks to Dr. S.V. Patel (I/c Director, SICART), for allowing me to use the Sophisticated Instruments of SICART. I would like to express my deep and sincere gratitude to Dr. Nirmal Kumar J.I., Professor and Head, P.G. Department of Environmental Science and Technology (ISTAR) and Dr. Merlin Thomas, Professor and Head, Industrial Chemistry (ISTAR), Dr. Rita N. Kumar, Professor and Head, Biological and Environmental Sciences Department
(NVPAS), for their moral support and cooperation throughout the research work.

I would be obliged to Dr. Gautam Sir, who guided me throughout my research work during the elemental analysis of WD-XRF.

I am grateful to all the officials of Sardar Patel University (SPU) for considering my request for thesis submission and providing uplift in my career.

Over and above everyone, I would like to express my gratitude and respect towards my parents, Mr. Thomas Mathai and Mrs. Sosamma Thomas, my sister (Mrs. Susan Rajesh), whose blessing are always with me, my little nephew Shawn Rajesh, whose mischievous and innocent smile inspired me to work with a positive Zeal. Their lifetime support and encouragement has provided the basic foundation of any success I will ever achieve.

I would also feel privilege to thank the lab Staff, Mr. Hiteshbhai and Mr.Vijaybhai, Pramodbhai and Riteshbhai, for their constant help, Parul Madam (Store In-charge) for her constant help throughout the research work for providing with all the lab requirements (Chemicals, Glassswares) with immediate response.

I owe deepest thanks to my research group members, in particular, Mrs Dhruti Patel, Ms. Kavita Thakur, Ms. Jignasha Patel, Ms. Megha Barot, Ms. Nidhi Parmar, Ms. Shamiyan Khan and Ms. Hiral Soni. The figures of some species used in this thesis from different sources (Google images, Google Earth) are highly acknowledged.

Last but not the least, I wish to express my feelings to all those people who have directly or indirectly helped me in achieving this dream and made it a successful reality.

Sheju Thomas Mathai

October, 2015