

ACKNOWLEDGEMENTS

First and foremost, I am truly grateful to **God** for his grace, which has enabled me to complete this work. I express immense gratitude and appreciation to everyone who has helped with the completion of this thesis, regardless of the specific role they played.

I am profoundly grateful to my supervisor **Prof. P. Padmaja Sudhakar**, Department of Environmental Studies, MSU, Baroda, who has supported me throughout my Ph.D. work with her great motivation and immense knowledge. This achievement was possible only because of the unconditional support provided by her. I owe a lot of gratitude to her for always being there for me and I feel privileged to be associated with a person like her during my life. I successfully overcame many difficulties and learned a lot. Her unflinching courage and conviction will always inspire me in the future.

I express my heartfelt gratitude to former Heads **Prof. K. Vachharajani** and **Prof. A. Arya**, Department of Environmental Studies, M. S. University of Baroda, Vadodara for providing the necessary infrastructure and resources to accomplish my research work. I am very thankful to former Heads **Prof. N.D. Kulkarni** and **Prof. A.V. Bedekar**, Department of Chemistry, MSU, for FTIR and TGA facility. My sincere thanks to **Prof. D. Chakraborty** (Department of Chemistry MSU, Baroda) for the immense help I received from her during my research. My sincere thanks to **Prof. H. Kataria** (Present Dean, Faculty of Science, MSU) and **Prof. A. C. Sharma** (Former Dean, Faculty of Science, MSU) for the immense help I received from them. This is an excellent opportunity for me to thank all of the Environmental Studies Department teaching and non-teaching staff members who have supported me over time.

This work was supported by the Board of Research in Nuclear Sciences (BRNS) under the National Uranium Project (NUP) scheme and SHODH- ScHeme of Developing High-quality

Research, Education Department, Gujarat State. So, I am thankful to the **BRNS** and **SHODH** for providing the financial assistance for the present work.

I would also like to extend my thanks to my seniors and juniors **Dr. Harnish Soni, Mr. Rahul Bhatt, Dr. Mohini Sadhu, Dr. Naznin Shaikh, Mridu Kulwant, Narottam Priydarshi, Virang Vaisveliya, Hetvi Dave, Radhika Rao, Arunima Khare and Shradhha Kanzariya** for technical and non-technical support throughout this academic journey and make pleasant research atmosphere.

I thank my labmates fellow **Shagufta, Dayanjali Thakkar, Monika Yadav, Himakshi Parmar, Shruti Chaudhari, Hardik Giri Gosai, Foram Jadeja, Asha Sharma, Apurva Marathe, and Jeanlin Foka** for stimulating discussions and for all the fun we have had during my research period.

I am thankful to Dr. **Vinay Kumar**, from the Department of Chemistry MSU, Baroda for his constant motivation. **Ms. Revathi Ganesh, Mr. Kalpesh Bhavsar, and Mr. Vasant** from the Department of Chemistry MSU, Baroda for their valuable support.

My sincere thanks to Chief Warden **Prof. Vijay M. Parmar**, Dy. Chief warden **Prof. Jaita Sharma, Dr. Kavita Shah** (present warden, PG Hall), **Dr. Shilpa** (former warden PG Hall), PG Hall hostel superintendent **Rupali Varman**, my roommates **Shivani Patel** and **Urvi Lad**, for making comfortable stay in hostel.

My lovely thanks to my friend **Dr. Rena, Dr. Pramod Yadava** for her support and constant encouragement in the process of my research. **Dr. Akhilesh Kumar Yadav** and **Dr. Manoj Jindal** for their support in my publications.

Finally, I would like to acknowledge with gratitude, the support valuable prayers, and love of my parents, **Shri Brijamohan Patel**, and **Shrimati Kamalawati Devi**; my sisters, **Jyotsana Patel** and **Shiksha Patel**, brother, **Mr. Prashant Patel** and cousins, **Mr. Sanjay Patel** and **Mr.**

Santosh Patel, my brother-in-law **Mr. Gajaraj Patel**, I could not have done it without them. I would like to acknowledge my big father **Shri Brijraj Patel** for his motivation and encouragement. I would never be able to pay back the love and affection showered upon by my parents. I owe thanks to a very special person, my husband **Mr. Gajanand Patel** for his affection, understanding, and continuing support to complete this research work. Also, I express thanks to my **in-laws** for their support in completing my research work. I greatly value their contribution and deeply appreciate it. I am admiring my **Nanaji (Shri Phulchand Patel)** for his encouragement, support, and unwavering belief in me. This research stands as a testament to my family's unconditional love and encouragement. Thanks to all my family members for believing in me.

In addition to this, several individuals have unknowingly and knowingly assisted me in finishing the project successfully. I apologise and am also grateful to them if I have left out a name from the group of guys with whom we were with all these days.

Divya Patel