

Acknowledgments

Creating a Ph.D. thesis is not an individual experience, rather it is an outcome of the extreme hardwork of several persons. I pay my most sincere and heartfelt gratitude to everyone who have made this thesis possible. I would first like to extend my most sincere thanks and appreciations to my thesis supervisor Dr. Ananya Debnath for providing me chance of a lifetime to become a part of her research group and introducing me to this exciting scientific field. My entire Ph.D. journey would have been unthinkable without her advice, dedicated support, motivation and enthusiasm. Her integral focus on research and the aim for producing high-impact work has deeply influenced me. I am profoundly grateful to her for always being a strong support at both professional and personal levels.

I would like to thank Dr. Debapratim Das, Professor, IIT Guwahati, and his entire research group for all the experimental supports and their excellent co-operation. I am grateful to Dr. Sriram Goverapet, TCS Research and Dr. Bidisa Das, IACS Kolkata for helping me in the quantum chemical calculations. Their invaluable contributions have enabled me to bring out the best from my research projects. My special thanks also go to faculty members of the Soft Matter Journal Club Dr. Ananya Debnath, Dr. Santosh Mogurampelly and Dr. Prabhat Jaiswal for concieving the idea of a common platform for discussions in the Soft Matter domain. I would also like to thank my committee members Dr. Manikandan Paranjyothy, Dr. Samanwita Pal and Dr. Satyajit Sahu at IIT Jodhpur.

I wish to acknowledge the wonderful support which I have received from my labmates and also my co-authors Mr. Raju Lunkad, Dr. Abhinav Srivastava and Mr. Avinash Garg. Working with them as a team has been a great pleasure to me. I am also thankful to my all other labmates Ms. Aishwarya, Ms. Sheeba, Ms. Neha, Ms. Purva, Mr. Parveen, Mr. Piyush and Ms. Renu for being the best support during the tough times. I am heartfully thankful to all my PhD colleagues Mrs. Manju, Dr. Deepak, Ms. Erum, Ms. Bhawna, Ms. Sumitra, Ms. Anchal, Ms. Divya, and Mr. Amitap for sharing my most cherishable moments with them. I would also like to thank Mr. Anil Kumar, Mr. Krishna Kant, Mr. Rinkesh Mangal, Mr. Rimpesh Katiyar, Mr. Dheerendra Yadav, Mr. Shubham Pandey, Mr. Ganpat Chaudhary, Ms. Swati Kushwaha and Mr. Sandeep Gehlot for their assistance regarding the technical and non-academic tasks.

I am deeply grateful to my two special friends, Mrs. Annu and Mrs. Sneha, for all their co-operations at different stages. They have always given me a happy distraction to keep my brain outside of research. Their incredible friendship shall never be forgotten. I extend my honest mention of thanks to all my old friends Ms. Isha, Mr. Prashant, Mr. Mohsin and many more with whom I share a great relationship as benevolent friends. With a deep sense of reverence, I am thankful to my parents, my brother and enormously to my grandfather who have been the pillars of my life. They have always motivated me with their words of wisdom. I am also grateful to all my family members for encouraging me with their inspiring words.

Above all, I am thankful to God for giving me the ability and patience to carry on this research and completing it satisfactorily. I have been blessed with the all the nicest people, without whom this journey would not have been successful.

...

