

ACKNOWLEDGEMENTS

It is my pleasure to thank several people who have been instrumental to the realization of this work.

First of all, I would like to thank Dr. S.M. Sharma for giving me an opportunity to be a part of his esteemed group. Despite his busy schedule and countless responsibilities, he always guided me and lent me words of wisdom whenever I went astray.

Next, I would like to thank Dr. M.N. Deo for his constant encouragement, good wishes and support. My Ph.D. journey would not have been half as smooth, had it not been for him.

Next, and very importantly, I am greatly indebted to Dr. Debducta Lahiri, without whom this Ph.D. would not have been possible. I could not have asked for a more knowledgeable, thorough person to work with. She has been the guiding force of my Ph.D. I know that supervising me can be a real test of patience! She, very selflessly and unflinchingly, guided me in every step of my Ph.D. She has constantly encouraged me to push my limits farther and farther. I thank her for her expert guidance and her invaluable time.

I thank the members of my doctoral committee – Dr. N.K. Sahoo and Dr. S.K. Dhar for their valuable suggestions during the course of my Ph.D.

I thank Dr. D. Bhattacharyya and Dr. S.N. Jha for their expert guidance and supervision during my experiments at Indus-2.

I am deeply indebted to Dr. Parasmani Rajput for all the support she has given me during my trips to Indore. She was ever-ready for motivational discussions and always had valuable advice to give me.

I thank Mr. K. Thankarajan from the workshop for teaching me basic designing, which helped me understand complicated drawings and also to design my own sample holders.

I thank Dr. R.S. Ningthoujam from Chemistry Division, BARC, for his ‘anytime’ help. He always connected me to the right people whenever I needed equipment/reagents etc.

I take this opportunity to thank my senior, Himil Bhatt, for proofreading parts of this thesis. He has helped me both professionally and personally in so many different ways that words are insufficient to express my gratitude. I also thank Dr. Susy Thomas for all the moral support and encouragement that she has given me. I am thankful to my

labmates – Shivkumar, Naini and Ashok for creating a lively environment for me to work in. I am also grateful to Shivkumar and Naini for helping me type the index pages of this thesis.

I thank my friends at BARC - Mitali, Sohini, Suresh, Priyanka, Naveen, Anita, Arundhati, Chandrani, Dipti, Shuvendu, for several stimulating and fruitful discussions and also for lending me mental support whenever I was in dire need of it.

I would like to thank Ms. Megha Sanjesh and Mr. Rajiv Sinha for helping out with all my official paperwork.

I would like to thank my friends outside BARC: Rishabh, for standing by me through the good times and the bad times and eternally reminding me to believe in myself; Puja, for her overwhelming belief in my abilities and for constantly reminding me of the greener sides of life and Amit for being the morale booster that he always is during the darkest of times.

Finally, I acknowledge with deepest regards the sustained support of my family- my grandmother, Lakshmi, my parents, Ramanan and Geetha, and my brother, Vaikunt who have stood by me through all these years, and believed, in the first place, that I have the capability to complete this Ph.D. Without them, I would be nothing.