

## *Acknowledgements*

*This thesis has benefited from help and contributions of a number of individuals. I take immense pleasure in writing this acknowledgment.*

*I express deep sense of gratitude to Prof. S. Krishnaswami, my thesis supervisor, who has been instrumental to guide me through acquisition, interpretation and presentation of geochemical data that this work is all about. More importantly, he gave me freedom to fight with him during discussions, taught me how to adopt a quantitative approach and made me enjoy geochemistry so much.*

*Prof. P. P. Patel and Prof. M. P. Patel of M. S. University have provided valuable advice and criticism during the course of this study. I thank them for their interest in this work.*

*I am grateful to Dr. J. R. Trivedi for teaching me the nuances of mass spectrometry. I learned from him how to work in a clean laboratory. He allowed me to use his mass spec, clean lab and the computer, which has gone a long way to finish this work. Dr. M. M. Sarin has been patient enough to teach me analytical techniques. I have learned a lot from his knowledge and understanding on instruments, which helped circumvent the problems during data acquisition. His critical comments helped improve one of the chapters of this thesis. I am thankful to Sunil for his help during establishment of Re chemistry in waters in this laboratory. He also helped me with mass spectrometry. I thank Prof. B. L. K. Somayajulu for his concern, encouragement and advice. He has kindly provided inputs to a part of this thesis.*

*I am thankful to Prof. S. K. Bhattacharya for taking interest in my work and for his inputs to one of the chapters of this thesis. Dr. Kanchan Pande has been enthusiastic to provide help and advice whenever I needed. Discussions with Dr. R. Ramesh have been fruitful and rewarding. I thank all the members of PRL Academic Committee who spent their time to critically review my work from time to time. My heartfelt thanks to R. Bhushan and R. Rengarajan for proofreading this thesis. Thanks are due to N. Juyal, A. D. Shukla and M. G. Yadava for their help and encouragement.*

*Dr. L. S. Chamyal and S. Bhandari have been very helpful throughout and saved me a lot of time and efforts by making things work for me in M. S. University. I thankfully acknowledge the help provided by Dr. Anil Kumar during analysis of Sr isotopes at NGRI, Hyderabad. Prof. K. Gopalan provided helpful suggestions on ion exchange chemistry of Sr. Prof. V. Subramanian kindly provided monthly discharge data for the Yamuna. R. A. Jani and P. Ghosh helped me during stable isotope*

*analysis of waters. I thankfully acknowledge help of M. Dixit in some of the analysis. This thesis has improved by constructive comments of Profs. K. K. Turekian and A.E. Kump and Dr. B. Peucker-Ehrenbrink. I thank authorities of Wadia Institute of Himalayan Geology, Dehradun for providing logistics during field campaigns.*

*It has been sheer joy to be in company of the Chemistry Gang: Ravi, Renga, Bhavsar, Pauline, Rajesh, Koushik, Anirban, Neeraj, Sudheer, who have been very supportive of this work through their help, criticism and encouragement. Folks! You all have been great.*

*I will always carry ineffable memories of moments I shared with a number of friends and individuals in PRL. The list includes, but is not limited to; Shikha, Shajesh, Sai, Duli, Rishi, Santosh, Sankar, Supriyoda, Vinai, Kaushar, Sudeshna, Subrata, Aninda, Arun, Lokesh, Tarak, Manoj, Ravindra, Neerja, Sanjaybhai and Jayendra. I thank all who have helped me at various stages of this work.*

*I sincerely thank staffs of the library, the computer center, the workshop, liquid nitrogen plant and glass blowing facility of PRL for their help.*

*I am highly indebted to my parents for their moral support, goodwill and encouragement, without which this work would not have been possible.*