Acknowledgement

Alhamdulillah, all praises and every gratitude is only due to the Almighty ALLAH. It is His blessings and countless favours that have shaped this thesis. I bow to Him in gratitude and I seek His blessing and forgiveness for me and the people around.

Our Beloved Prophet Muhammad (May Allah’s Peace, Mercy and Blessings be upon him) said that none is grateful to ALLAH unless he is grateful to His creation and to acknowledge them is to acknowledge Him.

Therefore, to begin with, a heartfelt gratitude substituted with heartiest prayers for Sir Syed Ahmed Khan for his tireless struggle and unbound concern for our today. I take this opportunity to thank him for giving us hope and lessons to conquer the universe. May Allah (SWT) grant him highest place in Jannat.

I also take this opportunity to convey my sincere gratitude and sense of indebtedness to all those who have been of help and care during this endeavour of my research.

In this regard firstly and foremostly, I convey my thankfulness and gratitude to my benign and humble supervisor Dr. Suhail Sabir. It is his guidance par excellence, kind cooperation and keen supervision that have been instrumental in the production of the work incorporated in the foregoing pages. Being under his supervision as a research scholar has always been an enriching experience both academically as well as technically. I respect him, I thank him and I acknowledge him.

I am grateful to Dr. Zain Ahmad Khan, Department of Chemistry A.M.U and Dr. Niyaz Ahmad Mir, Department of Chemistry A.M.U, for their valuable inputs, peer guidance and help during the course of this thesis.

I am also thankful to Prof. M. Muneer, Department of Chemistry A.M.U, for providing me the facility of photoreaction experiment during the first year of my research.

I pay my special thanks to the Chairman, Prof. M. Shakir, Department of Chemistry, for providing all the required infrastructure, and for his kind help and encouragement in carrying out the research work.
I believe that researchers in a lab constitute a family with some respectable and learned elders, a few growing scientists and the new comers who deserve love and guidance. In this context, my lab stands exemplary as Dr. Nida Qutub and Bilal Masood Pirzada deserve a lot of thanks for sharing their scientific experience and in carving all their juniors in the right frame of research. Next to them, Dr. Saima Sultana, Dr. Shabana Noor, Ms. Ishaat, Ms. Nehaal, Mr. Danish and Mr. Nafees also deserve sincere and deep appreciation for their guidance, advice, suggestions, cooperation, support and encouragement.

I wish to express my sincere thanks to Prof. Shabbir Ahmad and Dr. Shahid Husain, Department of physics, AMU for providing the instrumentation facility required for my experimentation. I would also like to thank Dr. Irshad Ahmad and Mr. Sheraz Ahmad, Department of Physics, AMU for their kind help and encouragement during my research work.

No endeavour of our life is achievable if our other self i.e., our friends are not there to nudge us and keep us in ignited spirits. Many people have their share in shaping and making my life colourful. They have always been there for me to encourage me when I was low, and pat me when I needed one. This acknowledgement cannot be completed if gratitude and thankfulness is not conveyed to them. Second to none in this category is my beloved senior Mr. Hilal Ahmad Bhat. Being with him at AMU was a turning point of my life. I take this opportunity to thank him for every advice, emotional support and care.

Tabasum Rasool also has always been at hand like a younger brother, ever ready to accompany me to my lab. Thank you so much Tabu, for being there ready and hearty at those late hours of night for providing company.

Being away from home is not a welcome experience to begin with, but when there are people like Imtiyaz Rasool Yettoo, Nayeem Ahmad, Mir Yasir Arafat, Ali Muhammad Malla, Khursheed Alam, Fayaz Ahmad, Javaid Ahmad Ganai, Sheeraz Ahmad Bhat, Adil Sultan, Jeelani, Amir Suhail, Muzafar Ahmad Bhat, Muzafar Ahmad Sheikh, Mohd. Asif, Aijaz Ahmad Rather, Iqbal Ahmad, Irfan Ahmad, Shah Tariq, Wasim Raza, Imtiyaz Ahmad Bhat, and Imtiyaz Yousuf whose company is always a soothing and bliss to enjoy.
Mr. Tariq Ahmad, Dr. Asiq Hussain, Dr. Parvez Ahmad, Mr. Ashiq Hussain, Dr Irfan-ul-Haq and Nazir Ahmad Alai need to be acknowledged and thanked specially for being seniors whose brotherly love, soothing company and unparalleled affection was something that made those early years at AMU one of the best memories of my life.

One cannot take the arduous journey of life without a proper guidance and group effort. I have been lucky enough to be acquainted with the most vibrant and religiously active students' group at AMU known as ‘Students of AMU’. Being part of this group was one of the best experiences at AMU. I thank this group from the core of my heart for lending that spiritual environs and space to me which was a life changing event. May Allah bless you guys and accept your struggle for Islam. Special mention may however be made of Dr. Abdul Rouf Mir, Abdul Aziz Faisal, Wajihuddin, Abu Bakar, Mannan Wani, Ryhaan, Junaid Wani, Shafat Wani, Hafiz Wasim, Ahmad Mehmood, Sheri Rehman, Gayasuddin, Yasin, Faraz, Adil, Mubashir, Shariq, Yusuf, Naseer, Sajjad and Musheer.

Life sketch at AMU would be incomplete if mention is not made of friends like Malik Ishfaq, Shakeel Ahmed Naikoo and Farooq Ahmed Malik for their genuinely humorous and energizing company.

Junaid Tariq, Tanveer Ahmed Sheikh, Zahid, Mudasir Rasool Yetto and Raja Muzamil also need a special gratitude for their brotherly company and making me feel at home away from home.

I also acknowledge UGC India for providing the financial support, and Department of Chemistry AMU, for providing all the facilities and technical support I needed during my research work. Acknowledgements are due to Department of Physics, AMU Aligarh and USIF AMU Aligarh for providing the instrumentation facility. Acknowledgements are also due to the DST-FIST and PURSE.

Research is a very mind aching and body wrenching process. It needs lots of affection, love, emotional support and prayers. It gives me a lot of happiness to convey my gratitude and soul deep indebtedness to the reason of my very being—my beloved parents, Mr. Munshi Mehraj-ud-din and Ms. Nigeena Begum. I would not have come such a long way in my life if they were not there at some very crucial
junctures. May Allah the Almighty reward them and prolong their shadow of love and
affection on me.

My younger brother Aafaq Mehraj also deserves special and profound thanks for his
contstant encouragement, advice, affection and support. Special thanks are due to my
loving brother Arif Mehraj and his wife Asia Arif who always strengthened my
morale by standing by me in all situations. My special thanks to my better half
Aarizoo Irshad who deserves a larger share of my success for we walked all steps
together from inception of the theory to the submission of the thesis.

A very special thanks goes to my cousins Mr. Fayaz Ahmad Bhat, Mr. Shafiq Ahmad
Bhat and Dr. Asif Bhat for standing with me and being there to be relied upon when
need made me to. My cousins Mudasir Tariq, Ishfaq Ahmad Bhat, Suhaib Fayaz,
Tehseen Yaseen, Farah Fayaz and Romia Irshad also need to be thanked who made
me happy when time was tough. I wish them all the best for their future.

At last, I once again prostrate before Allah SWT for His countless Blessings and
Benevolence to which this thesis owed.

Owais Mehraj