

# Acknowledgement

Ph.D. is the platform of learning where we learn more and more, not only about research but also many things that have great importance in our lives. Knowledge, sincere effort, dedication, patience, and hard work, accompanied by encouragement, helped me complete this work successfully.

It gives me great pleasure to express my gratitude to all those who have supported me and made their contributions to making this thesis possible. So first of all, I want to thank God for giving me the strength and for blessing me with the opportunities and capabilities required to pursue and complete this research work.

I am extremely thankful to **Dr. Rakesh K. Sharma**, my guide and a distinguished academician, whose profound subject knowledge and technical expertise have always been a guiding light. The depth of his knowledge has consistently helped me stay on the right path. His invaluable guidance has supported me throughout the research and writing of this thesis. It is only through his mentorship and encouragement that my research work gained both substance and structure. I could not have imagined a better advisor and mentor for my research.

I firmly believe that he is the ideal supervisor for students aspiring to excel in research, and I feel fortunate to have had the opportunity to work under his guidance. Despite numerous hurdles and ambiguous results, he never ceased believing in me. The freedom he granted and his supportive nature continually motivated me and were instrumental in the successful completion of this Ph.D. thesis. I will always remain deeply grateful to him.

I am grateful to **Prof. P. T. Deota**, Head, Department of Applied Chemistry, Faculty of Technology and Engineering, The Maharaja Sayajirao University of Baroda, who permitted me to do the research work and provided laboratory facilities.

I am also grateful and deeply obliged to **Prof. R. C. Tandel**, former head of the Department of Applied Chemistry, for his constant encouragement and everlasting moral support.

I would also like to thank **Dr. Sanjeev Kumar, Dr. Ran Bahadur, Dr. Sandhya Dixit, Dr. C. K. Modi, Dr. Babita Sehgal, and Dr. Vaishali Suthar** for their timely help and for providing research facilities available in their lab.

Especially, I would like to thank **Dr. Amit Dharva** (Director), **Dr. Mehul M. Patel** (Sr. Scientist), **Mr. Sudipbhai** (Research Assistant), and **Mr. Rahulbhai** (Lab Assistant) of the Gujarat Industrial Research and Development Agency (GIRDA), Government of Gujarat, Vadodara, for their unwavering support, suggestions, and instrumental analysis.

I always remember the drastic time within the tenure of research work and the support that I have got from my colleagues, who always understand each other in difficult situations. My special thanks go to **Dr. Hemil Patel, Mr. Saurav Patel, Dr. Vishal Vora, Ms. Madhu Matang, Mr. Sagar Bairwa, Mr. Srujal Sonera, Ms. Smita Katariya, Mrs. Megha Rathwa, Ms. Komal Trivedi, Dr. Darsana Hirpara, Dr. Vishwajit Chavda, Dr. Pratik Lakhani, Mr. Bharat Maru, Mr. Dhaval Bhanderi, Ms. Priyanka Mistry, Mrs. Dixita Prajapati, Mrs. Nidhi Kahar**, and for their help and coordination.

My heartfelt gratitude to **Dr. Aadhar Mandot** and **Mr. Sanjay Bambhaniya**, Department of Textile Engineering, Faculty of Technology and Engineering, The Maharaja Sayajirao University of Baroda, for their continuous support for instrumental analysis.

I want to express my sincere thanks to **Dr. Anju Kunjadiya** from the Indukakal pcowala Center for Interdisciplinary Studies in Science and Technology at Sardar Patel University, Anand. Their continuous support has been invaluable, particularly in the In-vitro antimicrobial study, and I am truly grateful for their expertise and guidance.

I would like to thank M.Sc. dissertation students **Mr. Parthik Bhandari** and **Mrs. Vidhi Patel** for being supportive. I am also thankful to my colleagues outside of the Department of Applied Chemistry.

I am grateful to all the non-teaching staff from our department, **Mr. Paragbhai, Mr. Vivekbhai, Mrs. Kaminiben, Mrs. Bhavnaben, Mr. Arvindbhai**, and **Mr. Vashntbhai**, Department of Applied Chemistry, Faculty of Technology and Engineering, The Maharaja Sayajirao University of Baroda, Vadodara, for their kind support.

I would like to thank **Mr. Yuvraj Solanki** for providing the latest research papers.

To all my hostelmates, **Dr. Pravin Patil, Mr. Aman Morya, Dr. Brajesh Bhagat, Mr. Navin, Mr. Kuldeep, Mr. Rushikesh**, and **Mr. Gunjan**. I am very, very thankful for all the emotional and intellectual support throughout my PhD journey and all the happy moments in hostel life.

I am greatly thankful to the Government of Gujarat and the KCG, Gandhinagar for their financial support through a **SHODH fellowship** award for my research work.

My heartfelt thanks go to my parents, **Mr. Manojbhai Ganvit** and **Mrs. Sangitaben Ganvit**, and my brother, **Mr. Monik M. Ganvit**, who have been exceptionally supportive and patient without questioning my choices; this work would not have been possible without their support and concern.

Finally, I would like to thank everybody who has played a role, directly or indirectly, in the successful realization of my dream in the form of this thesis.

**– Vikash M. Ganvit**