ACKNOWLEDGEMENT

First my deepest gratitude and thanks must be given to my guidance, Professor K.R. Gawai for his support, invaluable advice and encouragement which lead to success of this thesis. In particular, I would like to thank to Prof. D.D. Dhavale (Head, Dept. of Chemistry) former heads Prof Madhurima Dikshit and Prof. Mrs. R. S. Kusurkar for permitting me to use facilities at their respective department. I am short of words to express my gratitude to Dr. P.D. Lokhande Dr. K. M. Kodam, Dr. A. K. Nikumbh and Dr. M. V. Kulkarni for their warm advice, and fruitful discussion.

Special and warm thanks must be given to my parents, my brothers Abo Ahmed, Abo Alawam, and Dr. salah and sisters for their support me and encouragement.

Special loving thanks must be given to my wife who is always there in my life and warm grateful to my sons Sami, Maher, Mohammed, and Abdulrazaq my daughter Naemeh for being near to my heart.

There are many people contributing to the success of this thesis and I like to acknowledge all those who technically, financially or emotionally support and enable me to complete my study. I would like to express my gratitude to former principle, present principle, all staff and all my friends in Yafea College for their advice.

My thankful to my brothers in low and friends for contributed warm advice and friendship. I am thankful to my doctoral committee members for their constructive and precious suggestions. I must acknowledge as well the many friends, colleagues, students, teachers, archivists, and other librarians who assisted, advised, and supported my research and writing efforts over the years.

My thanks must go also to my lab members Munif Adnan, Dr. Santosh Misal, Dr. Chetan Oturkar, Dr. Ravindra Shinde, Vasudeo Sarwade, Dr. Arvind Korwar, Devendra Lingojar for their research assistance and their patience.

Ahmed Thabet Ahmed Al- Sarhe November, 2012