ACKNOWLEDGEMENT

I bow my head before God Almighty for the blessings showered upon me throughout this research programme.

I would like to express with great pleasure, my deep sense of obligation and gratitude to my supervising guide Dr. P.S. Sreejith, Professor, Division of Mechanical Engineering, School of Engineering, CUSAT and my co – guide Dr. K.E. George, Professor, Department of Polymer Science and Rubber Technology for their invaluable guidance, constant support and encouragement during the entire course of my research work.

I am grateful to Prof. M.P. Varghese, Secretary, M.A.College Association, Kothamangalam and the Principal, M.A.College of Engineering, Kothamangalam for permitting me to register as a part time research scholar at Cochin University of Science and Technology.

My heartfelt thanks are due to Dr. Eby Thomas Thachil (HOD); Dr.Rani Joseph, Dr. Philip Kurian, Dr. Thomas Kurian, and Dr. Sunil K. Narayanan Kutty of the Department of Polymer Science and Rubber Technology for their moral support and encouragement.

I wish to place my special thanks to Late Prof. (Dr.) A.V.Zacharia of Mechanical Engineering Department, M.A. College of Engineering, Kothamangalam who motivated me to do research.

I would like to acknowledge my earnest thanks to my colleagues at CUSAT, Dr. Jude Martin Mendez, Dr. P.V.Sreenivasan, Dr.Sinto Jacob, Abhilash George,
Bipin Pal, Ms. Sunitha George and all others at Dept of Polymer Science and Rubber Technology for their invaluable help and support in the execution of my work.

My unbound gratitude goes to my beloved parents Late R.R. Varma and Ambalika Thampuratty who took a lot of pain to help me and blessed me with their prayers.

I am deeply indebted to my wife Vrinda and my children Shyam and Vishnu for their understanding, tolerance, support and unlimited patience without which I would not have completed this study.

Date: 26 – 11 – 2010

DEVIPRASAD VARMA P.R.