Acknowledgements

It is always customary to start with the Research Advisor, Paul May. He has been a constant pillar of support and knowledge throughout my PhD. I could not have asked for a better Research Advisor. As well as this he has been a great friend/drinking partner. I am never sure whether to thank him for the many lab meals as I cannot usually remember them, I am sure they must have been good.

Bob Wild my first Second Assessor was also full of knowledge about everything surface related and even after his retirement was still as helpful as he could be. Keith Hallam filled the gap left by him nicely and taught me the way of the XPS and stayed in late with me to fix the problems I caused. At the IAC I also have to thank Peter Heard, Charles Younes and all those that made it feel like a home from home (a B.E.D. in fact) especially the postgraduates Gareth, Michelle, Mike and Tom.

Within Chemistry there are so many people to thank that if I thanked them all this little section would expand to twice the size of this thesis. Fredrik Claeyssens, or Fred to his friends, purveyor of fine theoretical data and great Karaoke. I will buy him that pint for the two weeks of sleepless nights at the synchrotron radiation source. Simon for being the King of the TEM and there to explain the finer aspects of crystallography. Keith Rosser was also a valuable asset, not only able to fix anything and everything; he also listened to my outbursts. Jake Filik my project student, assisted me and gave new aspects on old problems and for spending two weeks at the Synchrotron Radiation Source with me (sorry about the Bombay Badboy incident). James Smith for his tolerance and help with the laser. Gareth Fuge who had the unfortunate pick of having to share a room with me at Diamond 2002. I must also give thanks to the old members of the group, James Petherbridge, Matt Latto, Kevin Neil Allan for his no nonsense assessment of my results and and others. probing/thought provoking questions in various presentations. Dr. Tim Obey for employing me as a demonstrator throughout my PhD. Natalie for letting me loose in her synthetic lab and Kevin Jack for letting me poison him. Sean Davies and Jonathan Jones in Electron Microscopy. Finally I have to thank the current members of the group for putting up with the bad smells from the reactor (and me).

John Purton, arranged time for us on the Synchrotron Radiation Source. He also worked hard analysing the films. It is a pity that the results of this study did not lead anywhere.

Finally I would like to thank Michelle Spear for proof reading this thesis, and offering me support over this whole marathon of a PhD, listening to my gripes and putting up with my mood swings!! Without Michelle I would not have stuck at it long enough to even start the PhD let alone finish it. Words cannot describe how grateful to you I am.