Acknowledgements

I am deeply indebted to my advisor, Dr. Harry W. Gibson for his invaluable and appropriate guidance and advice to me throughout my graduate career at Virginia Tech. His sincere desires to create opportunities and develop the creative abilities of his students are equaled only by his professionalism and scientific knowledge of chemistry.

I thank my committee members, Dr. James E. McGrath, Dr. Hervé Marand, Dr. Joseph S. Merola, and Dr. James M. Tanko for their patience and dedication to serving on my graduate committee. I also thank Dr. Paul Deck for substituting for Dr. Merola during my defense and for helping with the X-Ray crystallography data. Dr. Merola also helped with the X-Ray crystallography for one crown ether, and for this I thank him. Also, Dr. Ilia Guzei and Dr. Arnold Rheingold deserve my thanks for their work on the three other X-ray structures they solved at the University of Delaware.

I would like to thank Dr. Bert Meijer and Dr. Tonny Bosman for their warm reception and hospitality for me while I was in the Netherlands at the Eindhoven University of Technology.

I would like to thank the members of Dr. Gibson's group (Donghang, Mingfei, Jim, Sang-hun, Nori, Dev, Hong, Hervé, Lesley, Phil, Mike, Melissa, Lance, Eric, Geoff, Rheinaldo, Bill, Susmita, and Jason) for their help and encouragement. I would especially like to thank Dr. Darin Dotson who took me aside many times in the beginning to tell me how not to do things.

I would like to thank my family, especially, my mother and father, who supported me with love and encouragement throughout my life. Special thanks go to my mother- and sisters-in-law for giving me great support as well.

Finally, my eternal gratefulness goes to my wife and daughter, for without their endless love and sacrifice I would not have been able to complete this work.