ACKNOWLEDGEMENTS

Words cannot express my gratitude to my advisor, Assoc. Prof. Dr. Prayoon Songsiriritthigul. He has provided me with great guidance, never-ending encouragement and supports. He has given me opportunities to access to different research facilities both in Thailand and abroad. He was kind and listened to my opinions even at conflicting times. Thousand thanks for accepting me as an advisee when I applied to study at SUT, and that has provided me with many educational opportunities. My thesis was not completed without invaluable advice and feedback form the Thesis Examining committee such as Prof. Dr. Rattikorn Yimnirun (Chairperson), Assoc. Prof. Dr. Panomsak Meemon, Prof. Dr. Supree Pinitsuntorn and Dr. Narong Chanlek.

In particular, Prof. Dr. Supree Pinitsuntorn for the access and advice on the VSM technique for the investigation of MnBi magnetic properties at the Faculty of Science, Khon Kaen University, Thailand.

I would also like to express my deepest gratitude to Dr. Chanchana Thanachayanont at MTEC (Thailand) for the advice and access to FE-SEM. Mr. Visittapong Yordsri is also acknowledged for his excellent skills and assistant in the FE-SEM observations.

I would like to thank Dr. Tanachat Eknapakul for assisting in analyzing the experimental results and helping in writing. I would also like to thank Asst. Prof. Dr. Michael F. Smith for his advice and help in writing manuscripts. I am very proud to have opportunities to attend his classes since I started at SUT.

Moreover, I am also thankful to Mr. Anuchit Ruangvittayanon at the microscopy laboratory of SLRI for valuable advice and assistant in the preparation of the crosssectional MnBi powder particles. I would like to thank Dr. Pinit Kitkhuntod and Dr. Ittipon Fongkeaw for advice and helps on measurements, data analysis and theoretical calculations of X-ray absorption spectra. Special thanks to all former and present members of the Nano-spectroscopy group. Especially, Dr. Thanit Saisopa (RMUTI), Mr. Satienrapong Ngamsomrit, Ms Hsu Thazin Myint, and Ms Myat Su Tun.

This work is financially supported by the Science Achievement Scholarship of Thailand (SAST), Thailand Center of Excellence in Physics (ThEP), and The Research Network NANOTEC (RNN) program.

Last but not least, I could not complete this journey without huge and neverending encouragement and supports from my parents, namely Mr. Sao and Mrs. Jittra Borsup. Thanks for their understanding all circumstance during the course of my study, which was quite often not easy. So, they never pressured me to follow my dreams to the end. Many thanks to my beloved family.

Jongrak Borsup