ACKNOWLEDGEMENTS

This thesis was completed with the help and support of several people. First and foremost, I would like to express my sincere gratitude to my advisor, Assoc. Prof. Dr. Worawat Meevasana who guided, instructed, and motivated me. He provided this opportunity and led me along the path of research under his supervision. He is an excellent advisor due to his kindness, dedication, and encouragement. I learned a great deal from him, including the research process, research planning, data analysis, and time management. He has helped and supported me through every step to get to where I am today. Also, I would like to express my deepest gratitude to my co-advisor, Dr. Sorawis Sangtawesin, who was always beside me and believed in my potential to pass through all the difficulties in this thesis. Without their encouragement and motivation from him, I would not have been able to complete this journey. Their expertise and patience have been invaluable to me and have played a crucial role in the success of this thesis. He shares knowledge and good scientific skills with me, including attitudes towards various aspects such as time management. Apart from being an excellent advisor, he is also an idol in my life.

For my defense, I would like to acknowledge Assoc. Prof. Dr. Panomsak Meemon, Assoc. Prof. Dr. Prayoon Songsiriritthhigul, and Asst. Prof. Dr. Sukrit Sucharitakul for giving their valuable time, reviewing my thesis, and providing constructive feedback during my Ph.D. defense.

Importantly, I would like to acknowledge the Science Achievement Scholarship of Thailand (SAST) for providing financial support while pursuing my bachelor's degree and this research has received funding support from the NSRF via the Program Management Unit for Human Resources & Institutional Development, Research and Innovation [B05F640051, B05F650024].

Also, I would like to thank everyone in the Meevasana Group, QLAB, OCT lab, Synchrotron Light Research Institute (SLRI), Facility Building 10 (F10), all the staff and students in the School of Physics (SUT) for always being beside and support me.

Last but not least, I am indebted to my parents and brother for unwavering support, understanding, and motivation during this challenging journey. Their belief in my abilities has been a driving force that propelled me forward.

Aissara Rasritat