



Dr. Utpal Bora
Assistant Professor
Department of Chemical Sciences
Tezpur University
Tezpur, Napam - 784 028
Assam, India
e-mail : ubora@tezu.ernet.in
Phone : +91-3712-275067
Fax : +91-3712-267005

CERTIFICATE OF THE SUPERVISOR

This is to certify that the thesis entitled “*Exploring Transition Metal Based Catalytic Systems for Suzuki-Miyaura and Sonogashira Cross Coupling Reactions Under Greener Reaction Conditions*” submitted to the School of Sciences, Tezpur University in part fulfillment for the award of the degree of Doctor of Philosophy in the Department of Chemical Sciences is a record of research work carried out by *Ms. Manashi Sarmah* under my supervision and guidance.

All help received by her from various sources have been duly acknowledged.

No part of this thesis has been submitted elsewhere for award of any other degree.

Date:
Place:

Dr. Utpal Bora
Assistant Professor
Department of Chemical Sciences
Tezpur University
Assam, India



TEZPUR UNIVERSITY

(A Central University established by an Act of Parliament)
Napaam, Tezpur – 784 028, District – Sonitpur, Assam, India

CERTIFICATE OF THE EXTERNAL EXAMINER AND ODEC

This is to certify that the thesis entitled “*Exploring Transition Metal Based Catalytic Systems for Suzuki-Miyaura and Sonogashira Cross Coupling Reactions Under Greener Reaction Conditions*” submitted by *Ms. Manashi Sarmah* to the School of Sciences, Tezpur University in part fulfillment for the award of the degree of Doctor of Philosophy in the Department of Chemical Sciences has been examined by us on _____ and found to be satisfactory.

The committee recommends for the award of the Degree of Doctor of Philosophy.

Signature of:

Principal Supervisor

Date:

External Examiner

Date:

Acknowledgements

“Acknowledgement is the only way to keep love alive” — Barry Long

At this moment of accomplishment, it gives me a great pleasure in expressing my gratitude to all those who contributed in many ways to the success of this study and made this thesis possible. Though, it will not be enough to express my gratitude in words to all those people who helped me, I would still like to thank all these people who made it an unforgettable experience for me.

First and foremost, I would like to thank the almighty for showering his blessings and giving me the strength, courage and patience to make everything possible.

I would like to express my profound sense of reverence to my research supervisor Dr. Utpal Bora, for his constant encouragement, support, motivation, exceptional guidance and untiring help during the course of my research work. I feel privileged to enjoy complete freedom to use my opinion in the research work, which has helped in bringing out the best in me. I consider myself very fortunate to carry out research under such a dedicated and principled personality.

I offer my sincere thanks to Prof. Ashim Jyoti Thakur, Head and Prof. Ramesh Ch. Deka, former Head, Department of Chemical Sciences, Tezpur University for their valuable support and help in various aspects. I am also grateful to my Doctoral Committee members, Prof. Ashim Jyoti Thakur and Dr. Pankaj Bharali, Assistant Professor, Department of Chemical Sciences, Tezpur University for their suggestions and inspiration throughout my research period.

I feel privileged to work with Dr. Anindita Dewan and would like to convey my heartiest thanks for her constant support, suggestions and friendliness during my Ph. D. tenure.

My ample appreciation remains to Dr. Sajal K. Das and Dr. Sanjeev P. Mahanta, Assistant Professor, Department of Chemical Sciences, Tezpur University for their valuable suggestions and allowing me to use different laboratory facilities.

I am thankful to Dr. Manash R. Das, Scientist, CSIR-NEIST for his help and suggestion required during my research work.

I would like to take the opportunity to thank SAIC Tezpur University, SAIF North Eastern Hill University, SAIF IIT Madras and SAIF Cochin University as well as to Dr. Venkatesha, Chemistry Research Centre, Bangalore Institute of Technology for helping me in analysis of my research samples.