## SUPPORTED GROUP 11 TRANSITION METAL CATALYSTS IN LIQUID PHASE REACTIONS USING THE BORROWING HYDROGEN METHODOLOGY

## LIU HUIHUI

(B. Sc. (Hons.), National University of Singapore)

## A THESIS SUBMITTED FOR THE DEGREE OF DOCTOR OF PHILOSIPHY DEPARTMENT OF CHEMISTRY NATIONAL UNIVERSITY OF SINGAPORE 2013

## Declaration

I hereby declare that this thesis is my original work and it has been written by me in its entirety, under the supervision of Prof Stephan Jaenicke,

(in the laboratory catalysis lab in S5-04-04 and S5-02-02),

Chemistry Department, National University of Singapore, between August 2008 and December 2012.

I have duly acknowledged all the sources of information which have been used in the thesis.

This thesis has also not been submitted for any degree in any university previously.

The content of the thesis has been partly published in:

 <u>H. H. Liu</u>, G. K. Chuah, S. Jaenicke\*, N-alkylation of amines by alcohols over alumina-entrapped Ag catalysts using "borrowing hydrogen" methodology, J. Catal 292.(2012) 130

Liu huihui

Name

*Liu huihui* Signature 28/12/2012 Date