METHANE DRY REFORMING OVER COPPER AND IRON SUBSTITUTED STRONTIUM COBALT OXIDE PEROVSKITE CATALYST

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BACHELOR OF CHEMICAL ENGINEERING

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METHANE DRY REFORMING OVER
COPPER AND IRON SUBSTITUTED STRONTIUM COBALT OXIDE
PEROVSKITE CATALYST

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SUPERVISOR'S DECLARATION

I hereby declare that I have checked this thesis and in my opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Bachelor of Chemical Engineering.

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Date : 10 DECEMBER 2016

STUDENT'S DECLARATION

I hereby declare that the work in this thesis is my own except for quotations and summaries which have been duly acknowledged. The thesis has not been accepted for any degree and is not concurrently submitted for award of other degree.

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Dedication

"Research is what I'm doing when I don't know what I'm doing."

Wernher von Braun

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a : effective cross-sectional area of one adsorbate molecule

C : dimensionless constant related to the enthalpy adsorption of adsorbate gas

d : spacing between layers of atoms

D : crystalline size

$I_{\alpha}\ (hkl)$: intensity of the diffraction line (hkl) from a phase α

K : dimensionless shape factor

$K_{\alpha}(hkl)$: constant for a given phase structure α, diffraction line *(hkl)*

k_{Sch} : Scherrer constant

m : mass of test powder

n : order of reflection (integer)

N : Avogadro constant

P : partial vapour pressure of adsorbate gas in equilibrium

P_0 : saturated pressure of adsorbate gas

P/P_o : relative pressure

R : gas constant

STP : standard temperature and pressure

T : temperature

V_a : volume of gas adsorbed at STP

V_M : volume of gas adsorbed corresponding to monolayer coverage

X_{α} : weight fraction of phase α

Greek

λ : wavelength

β : line broadening at half the maximum intensity (FWHM)

θ : Bragg angle

ρ_{α} : mass fraction of phase α

$(\mu/\rho)_m$: mass absorption coefficient of the mixture

LIST OF ABBREVIATIONS

BET	Brunauer-Emmett-Teller
EDX	Energy Dispersive X-ray Spectroscopy
FESEM	Field Emission Scanning Electron Microscopy
SEM	Scanning Electron Microscope
XRD	X-ray Diffraction