Thesis Title

Your name

A thesis submitted to the
Faculty of Science,
University of the Witwatersrand,
Johannesburg,
in fulfillment of the requirements for the degree of
Doctor of Philosophy

Supervisor: Supervisor name

Johannesburg, November 2016

Declaration of Authorship

I, Your name, declare that this thesis titled, 'Thesis Title' and the work presented in it are my own. I confirm that:

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- Where I have consulted the published work of others, this is always clearly attributed.
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- I have acknowledged all main sources of help.
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"Fill in some quote here"

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UNIVERSITY OF THE WITWATERSRAND

Abstract

Faculty of Science
School of Chemistry

Doctor of Philosophy

Thesis Title

by Your name

The Thesis Abstract is written here (and usually kept to just this page). The page is kept centered vertically so can expand into the blank space above the title too…

Acknowledgements

Contents

Abbreviations

A

Å angstrom

Ac acetyl

Ar aryl

Arom. aromatic

B

Bn benzyl

Boc *tert*-butyl carbonate

BP boiling point

BuLi butyl lithium

C

°C degrees Celsius

CIMS Ceric ammonium nitrate

CIMS chemical ionisation mass spectroscopy

COSY correlation spectroscopy

CSD Cambridge structure database[?]

D

DCM di-chloromethane

DDQ 2,3-dichloro-5,6-dicyano-1,4-benzoquinone

DIA diisopropylamine

DMAP 4-N,N-dimethylaminopyridine

DMSO dimethylsulfoxide

E

EIMS electron ionisation mass spectroscopy

ESIMS electrospray ionisation mass spectroscopy

Et ethyl

EtOAc ethyl acetate

eq equivalents

H

h hour

HMBC heteronuclear multiple bond correlation

HSQC heteronuclear single-quantum correlation

I

***i*-Pr** *iso*-propyl

IR infrared

M

Me methyl

min minute

MP melting point

N

NBS N-bromo-succinimide

***n*-Bu** *n*-butyl

NMP N-methyl pyrilidone

NMR nuclear magnetic resonance

***n*-Pr** *n*-propyl

P

Ph phenyl

PMB *para*-methoxy-benzyl

R

rt room temperature

T

TBAF tetra-butyl-ammonium-fluoride

TBDMS *tert*-butyldimethylsilyl

***t*-Bu** *tert*-butyl

TEA triethylamine

Tetrakis $Pd(PPh_3)_3$)

THF tetrahydrofuran

TLC thin layer chromatography

TMS tetramethyl-silane/trimethyl-silane

Tosyl toluenesulfonyl

TOF Turn over frequency

TON Turn over number

Q

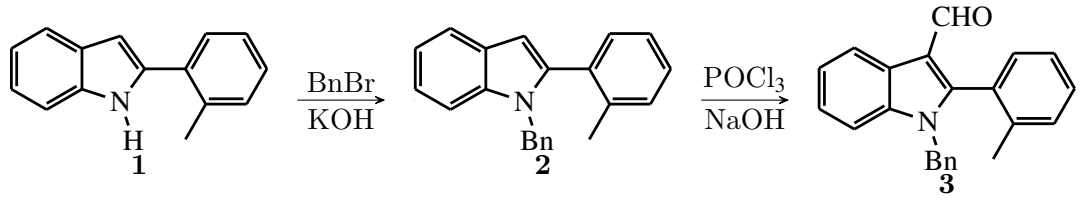
quant quantitative

Chapter 1

Example

1.1 Sectional example

Now I will reference Scheme 1.1 in text.



SCHEME 1.1: The synthesis of **3** from the indole by formylation and benzyl protection.

$CH_3(C{=}O)CH_3$ or $MgSO_4$

Chapter 2

Introduction

Chapter 3

Experimental templates and examples

3.1 NMR

NH2 - (s, 2H, N$\underline{\mathbf{H}}_2$)

NH - (s, 1H, N$\underline{\mathbf{H}}$)

CH3 - H - (s, 3H, C$\underline{\mathbf{H}}_3$) C - ($\underline{\mathbf{C}}\mathrm{H}_3$)

Si(CH3)3 - C - (Si($\underline{\mathbf{C}}\mathrm{H}_3)_3$)

C(CH3)3 (tert-carbon underlined) - C - ($\underline{\mathbf{C}}(\mathrm{CH}_3)_3$)

C(CH3)3 (methyl underlined) - C - (C($\underline{\mathbf{C}}\mathrm{H}_3)_3$)

C CH - H - (s, 1H, ≡C$\underline{\mathbf{H}}$) C - (≡$\underline{\mathbf{C}}$H)

C-C C - C - (C–$\underline{\mathbf{C}}$≡C)

N-C=O - C - (N–$\underline{\mathbf{C}}$=O)

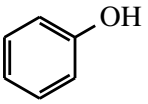
aromatic C - (C-arom.)

CH2 - H - C$\underline{\mathbf{H}}_2$ C - $\underline{\mathbf{C}}\mathrm{H}_2$

3.2 experimental entrty

Phenol (4)

Yield:



MP:

IR (cm^{-1}): $\bar{\nu}$

^{1}H NMR (300MHz, $CDCl_3$): δ

^{13}C NMR (75MHz, $CDCl_3$): δ

HRMS:

()

Yield:

MP:

IR (cm^{-1}): $\bar{\nu}$

^{1}H NMR (300MHz, $CDCl_3$): δ

^{13}C NMR (75MHz, $CDCl_3$): δ

HRMS:

3.3 crystal tables

3.4 chemfig

Boc ([:30]-([2]=O)([:330]-O([:30]-([2]-)([:30]-)([:330]-)

TABLE 3.1: Crystal data of

Empirical formula	$C_{11}H_{14}N_2Si_1$
Formula weight	
Temperature	K
Wavelength	Å
Crystal system	
Space group	C
Unit cell dimensions	
a = Å	$\alpha = ^\circ$
b = Å	$\beta = ^\circ$
c = Å	$\gamma = ^\circ$
Volume	$Å^3$
Z	
Density (calculated)	Mg/m^3
Absorption coefficient	mm^{-1}
F(000)	
Crystal size	mm^3

TABLE 3.2: Data collection of

θ range for data collection	$^\circ$ to $^\circ$
Index ranges	$-\preceq h \preceq$, $-\preceq k \preceq$, $-\preceq l \preceq$
Reflections collected	
Independent reflections	$[R(int) =]$
Completeness to $\theta = ^\circ$	%

TABLE 3.3: Refinement of

Refinement method	Full-matrix least-squares on F^2
Data / restraints / parameters	/ /
Goodness-of-fit on F^2	
Final R indices $[I > 2\sigma(I)]$	R1 = , wR2 =
R indices (all data)	R1 = , wR2 =
Largest diff. peak and hole	and - e.$Å^{-3}$

Appendix A