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THE SYNTHESIS, FUNCTIONALISATION AND CHARACTERISATION OF CARBON NANOTUBES / ALUMINA HYBRID COMPOUND AND ITS NANOCOMPOSITES

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THE SYNTHESIS, FUNCTIONALISATION AND CHARACTERISATION OF CARBON NANOTUBES / ALUMINA HYBRID COMPOUND AND ITS NANOCOMPOSITES

by

NORLIN BINTI NOSBI

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LIST OF ABBREVIATIONS

APCVD	Atmospheric Pressure Chemical Vapour Deposition
BET	Brunauer-Emmet-Teller
BJH	Barret-Joyner-Halenda
CNT	Carbon Nanotubes
CTE	Coefficient of Thermal Expansion
CVD	Chemical Vapour Deposition
DFT	Density Functional Theory
DSC	Differential Scanning Calorimetry
DTG	Derivative Thermogravimetric
EDX	Energy Dispersive X-Ray Spectroscopy
FESEM	Field Emission Scanning Electron Microscope
FTIR	Fourier Transform Infrared Spectroscopy
HDPE	High Density Polyethylene
HRTEM	High Resolution Transmission Electron Microscopy
ICSD	Inorganic Crystal Structure Database
IUPAC	International Union of Pure and Applied Chemistry
LED	Light Emitting Diodes
LPCVD	Low Pressure Chemical Vapour Deposition
MWCNT	Multi Walled Carbon Nanotubes
PDMS	Polydimethylsiloxane
PECVD	Plasma Enhance Chemical Vapour Deposition
RBM	Radial Breathing Modes
ROM	Rule of Mixture
SEM-AFM	Scanning Electron Microscopy-Atomic Force Microscopy

S_A	Surface Area
Ss	Specific Surface Area
SWCNT	Single Walled Carbon Nanotubes
TGA	Thermogravimetric Analysis
TPS	Transient Plane Source
XPS	X-Ray Photoelectron Spectroscopy
XRD	X-Ray Diffraction

LIST OF SYMBOLS

a	Distance
α	Thermal diffusivity
α_t	Linear Thermal Expansion Coefficient
Å	Angstrom
ACj	Exposed Area of The Pore
Al	Aluminium
Al_2O_3	Alumina
$Al(NO_3)_3.9H_20$	Aluminium Nitrate Salts
$Al(OH)_4$	Hydroxoaluminates
Ar	Argon
$\vec{C}_h$	Chiral Vector
°	Degree
°C	Degree Celsius
°C/ min	Degree Celsius per Minute
c	Constant
C	Carbon
C-C	Carbon-Carbon
CH_4	Methane
C_2H_2	Acetylene
C_2H_4	Ethylene
C_2H_6	Ethane
C_4H_{10}	Butane-n
$C_{12}H_{27}AlO_3$	Aluminium Tri-Sec-Butoxide
$CH_3[Si(CH_3)_2O]n Si(CH_3)_3$	Polydimethylsiloxane

Cl_2	Chlorine
cm	Centimetre
cm^{-1}	Per Centimetre
C=O	Carbon-Oxygen
Co	Cobalt
COOH	Carboxylic
$Co(NO_3)_2.6H_2O$	Cobalt Nitrate
Cp	Specific Heat Capacity
cP	Centi Poise
cSt	Centi Stokes
D	Diameter
D band	Defect Bands
D' band	Shift Defect Bands
dV(r)	Differential Pores Size Distribution
E	Young Modulus
$Ɛ_0$	Expansion Ratio
Ɛr'	Relative of the Permittivity
Ɛr''	Loss Tangent of the Permittivity
eV	Electron Volt
f	Frequancy
F_2	Fluorine
Fe	Ferum
$Fe(NO_3)_3.H_2O)$	Iron Nitrate
F/m	Farad per Meter
g/cm^3	Density
g/l	Gram per Liter
G band	Graphite Band