

PREPARATION AND CHARACTERISATION OF
CALCIUM OXIDE FROM GYPSUM BASED
COMPOUND FOR TRANSESTERIFICATION OF
WASTE COOKING OIL

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We hereby declare that we have checked this thesis and in our opinion, this thesis is adequate in terms of scope and quality for the award of the degree of Master of Science (Industrial Chemistry)

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STUDENT'S DECLARATION

I hereby declare that the work in this thesis is based on my original work except for quotations and citations which have been duly acknowledged. I also declare that it has not been previously or concurrently submitted for any other degree at Universiti Malaysia Pahang or any other institutions.

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LIST OF SYMBOLS

α	Roman alphabet alpha
β	Roman alphabet beta
<	Less than
>	Greater than
\geq	Greater than and equals to; atleast
$^{\circ}$	degrees of angular arc
$^{\circ}\text{C}$	Material temperature in degree Celsius
μm	Material length, width or height in micrometer
A_{IS}	internal standard (methyl heptadecanoate) peak area
C_{IS}	concentration of the internal standard solution, in mg/mL
V_{IS}	volume of the internal standard solution used, mL

LIST OF ABBREVIATIONS

CEU	Council of the European Union
DOE	Department of Environment Malaysia
FAME	Fatty acid methyl esters
FESEM-EDX	Field emission scanning electron microscopy-electron dispersive X-ray
FFA	Free fatty acids
FGD	Flue gas desulphuriser
FGG	Flue-gas gypsum
GC-FID	Gas chromatography-flame ionisation detector
ICP-MS	Inductively coupled plasma mass spectrometry
MeOH	Methanol
OM	Organic matter
SEM	Scanning electron microscopy
SW	Scheduled Waste
TGA	Thermogravimetric analysis
WCO	Waste cooking oil
XRD	X-ray diffraction
XRF	X-ray fluorescence
ZWS	Zero Waste Scotland
°C	Material temperature in degree Celsius
g	Material mass in gram
g/cm ³	Material density in gram per centimeter cube
g/L	Solution concentration in gram per litre
g/mol	Material molar mass in gram per mol
h	Time in hour
M	Solution concentration molar concentration
m	Material length, width or height in meter
mg/mL	Solution concentration in milligram per millilitre
mL	Solution or liquid volume in millilitre
mm	Material length, width or height in millimeter
MT	Material mass in metric tons
ppb	relative abundance of dissolved minerals in parts-per-billion

ppm	relative abundance of dissolved minerals in parts-per-million
wt. %	Weight percentage
ΣA	total peak area