TORREFACTION AND PELLETIZATION OF OIL PALM WASTE AND FORESTRY RESIDUE

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TORREFACTION AND PELLETIZATION OF OIL PALM WASTE AND FORESTRY RESIDUE

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SUPERVISOR'S DECLARATION

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 Bachelor of Chemical Engineering.

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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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Dedicated to my family, supervisor and friends.

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LIST OF SYMBOLS

mm	millimetre
cm	centimetre
°C	Celcius
L	Litre
min	minute
MPa	Mega pascal
g	gram
Hg	Heat of combustion
t	temperature rise
W	Watt
e_3	correction in calories for heat of combustion of fuse wire
m	mass
$M_{torrefied}$	mass of torrefied sample at certain temperature
M_{raw}	mass of dry sample
$HHV_{torrefied}$	high heating value of torrefied sample
HHV_{raw}	high heating value of dry sample
%	percentage
wt	weight
µm	micrometre
kN	kiloNewton
kg	kilogram
MJ	megajoules
Mn/T	Million tonnes

LIST OF ABBREVIATIONS

CO_2	Carbon dioxide
EFB	Empty fruit bunch
OH	Hydroxyl group
OPF	Oil palm frond
OPT	Oil palm trunk
PKS	Palm kernel shell
PMF	Palm mesocarp fibre
POME	Palm oil Mill effluent
SEM	Scanning Electron microscopy