

**DEVELOPMENT OF NATURAL-POZZOLAN BASED
ALKALI ACTIVATED CONCRETE INCORPORATING
NANO-SILICA**

by

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IN THE NAME OF ALLAH, MOST GRACIOUS, MOST
MERCIFUL

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LIST OF ABBREVIATIONS

A:	Aluminosilicate,
AAB:	Alkali activated binder
AAC:	Alkali activated concrete
AAS:	Alkali Activated Slag
Ar:	Anorthite,
ASTM:	American Society for Testing of Materials
C/N-A-S-H:	Calcium/Sodium-Alumina Silicate Hydrate
C:	Calcite
CA:	Cristobalite alpha,
C-A-S-H:	Calcium-Alumina-Silicate-Hydrate
CE:	Counter Electrode
C-S-H:	Calcium Silicate Hydrate,
D:	Diopside,
EDS:	Energy Dispersive Spectroscopy
FA:	Fly ash
Fr:	Forsterite,
FTIR:	Fourier Transform Infra-Red
G:	Gypsum,
GGBFS:	Ground granulated blast furnace slag
GHG:	Green House Gas
H:	Hematite
LOI:	Loss on Ignition
LPR:	Linear Polarization Resistance
LVDT:	Linear Variable Displacement Transducer
MIP:	Mercury Intrusion Porosimetry
N-A-S-H:	Sodium-Alumina-Silicate-Hydrate
NMR:	Nuclear Magnetic Resonance
NP:	Natural pozzolan
nSiO ₂ :	Nano-silica
OPC:	Ordinary Portland cement

P:	Portlandite Ca(OH)_2
P:	Phillipsite
POFA:	Palm oil fuel ash
Q:	Quartz
RE:	Reference Electrode
RF:	Radio Frequency
SCE:	Saturated Calomel Electrode
SCMs:	Supplementary cementitious materials
SEM:	Scanning Electron Microscope
SF:	Silica fume
SH:	Sodium hydroxide
SS:	Sodium silicate
TAA:	Total Alkaline Activator
VPV:	Volume of permeable voids
WE:	Working Electrode
XRD:	X-ray Diffraction
XRF:	X-Ray Fluorescence
Z:	Zeolite Y

LIST OF SYMBOLS

$^{\circ}$	Degree
$^{\circ}/\text{min}$	degrees/minute
$^{\circ}\text{C}$	Degree Celcius
$\mu\text{A}/\text{cm}^2$	Micro ampere/centimeter square
μm	Micro-meter
cm^{-1}	Per centimeter
cm^3	Cubic centimeter
cps	Cycles per second
<i>gr</i>	Gram
gr/cm^3	gram/cubic centimeter
gr/mol	gram/mol
gr/cc	gram/cubic centimeter
Gt	Gigaton
h	Hour
kg/m^3	Kilogram per cubic meter
kN	Kilo Newton
kN/sec	Kilo Newton per second
kV	Kilo Volts
$\text{k}\Omega.\text{cm}^2$	Kilo ohm square centimeter
M	Molarity
m^2/gr	Square meter/gram
m^2/kg	Square meter/kilogram
m^2/s	Square meter/second
mA	Milli ampere