

## LIST OF ABBREVIATIONS AND SYMBOLS

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XRD	X-ray diffraction
DGEBA	Diglycidyl ether of bisphenol-A
ATRP	Atom transfer radical polymerization
VOC	Volatile organic compound
CNT	Carbon nanotube
CNF	Cellulose nanofibers
GO	Graphene oxide
RGO	Reduced graphene oxide
ECH	Epichlorohydrin
BPA	Bisphenol-A
NME	Novolac modified epoxy
CAE	Cyclo-aliphatic epoxy
MMT	Montmorillonite
HCl	Hydrochloric acid
NaOH	Sodium hydroxide
KOH	Potassium hydroxide
dL	Deciliter (s)
g	Gram (s)
ASTM	American Society for Testing and Materials
DB	Degree of branching
GPC	Gel permeation chromatography
FTIR	Fourier transform infrared
NMR	Nuclear magnetic resonance
UV	Ultraviolet
UTM	Universal testing machine
TGA	Thermogravimetric analysis
DSC	Differential scanning calorimetry
$T_g$	Glass transition temperature
$T_m$	Crystalline melting temperature
MHz	Megahertz

LCR	Inductance, capacitance and resistance
LOI	Limiting oxygen index
SPR	Surface plasmon resonance
PL	Photoluminescence
SEM	Scanning electron microscope
TEM	Transmission electron microscope
SPM	Scanning probe microscopy
STM	Scanning tunnelling microscopy
AFM	Atomic force microscopy
CFU	Colony forming unit
FRP	Fiber reinforced plastic
LED	Light emitting diodes
cm	Centimeter (s)
nm	Nanometer (s)
PE	Pentaerythritol
EtOH	Ethanol
PAA	Poly(amido-amine)
NaCl	Sodium chloride
THF	Tetrahydrofuran
DMSO	Dimethyl sulfoxide
mm	Millimeter (s)
mL	Milliliter (s)
PHE	Pentaerythritol based hyperbranched epoxy
SBE	Bisphenol-A based linear epoxy
phr	Parts per hundred
MeOH	Methanol
DMF	Dimethyl formamide
DMAc	Dimethyl acetamide
CHCl <sub>3</sub>	Chloroform
CH <sub>2</sub> Cl <sub>2</sub>	Dichloromethane
Pa s	Pascal second (s)
mg	Milligram (s)
eq.	Equivalent

%	Percentage (s)
MPa	Megapascal (s)
kg	Kilogram (s)
TEA	Triethanolamine
TAHE	Triethanolamine based hyperbranched epoxy
PAD	First generation of poly(amido-amine) dendrimer
bp	Boiling point
mp	Melting point
cc	Cubic centimeter (s)
Bis-MPA	2,2-Bis(hydroxyl methyl) propionic acid
NaOMe	Sodium methoxide
PTSA	p-Toluene sulfonic acid
HBPP	Hyperbranched polyester polyol
HBPE	Hyperbranched polyester polyol based epoxy
$K_{IC}$	Stress intensity factor
$G_{IC}$	Critical strain energy release
$K_E$	Einstein's coefficient
$V_f$	Volume fraction
OMMT	Octadecyl amine modified montmorillonite nanoclay
NO	Neem seed oil
OD	Optical density or absorbance
PDB	Potato dextrose broth
EDX	Energy dispersive X-ray spectroscopy
SAED	Selected-area electron diffraction
eV	Electron volt
rpm	Revolutions per minute
$e^-/h^+$	Electron/hole
MITH	2-Methyl-4-isothiazolin-3-one hydrochloride
DNA	Deoxyribonucleic acid