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LIST OF SYMBOLS

C_p	-	Capacitance
V	-	Voltage
Q	-	Electrical charge
ε	-	Dielectric constant
ε_o	-	Dielectric constant of free space
A	-	Surface area of the electrode
t	-	Sample thickness
tanδ	-	Dielectric loss
ε'	-	Real part of dielectric constant
ε"	-	Imaginary part of dielectric constant
P	-	Polarization
E	-	Applied electric field
n	-	Integer
λ	-	Wavelength of X-rays
d	-	Distance between crystal lattice planes
θ	-	Angle of diffraction
I_c	-	Intensity of crystalline part
I_a	-	Intensity of amorphous part
X_c	-	Degree of crystallinity
I_o	-	Intensity of incident radiation
I	-	Intensity of transmitted radiation
a	-	Constant for each absorbing material
L	-	Path length of the absorbing solution

c	-	Concentration of absorbing solution
µm	-	Micrometer
^{o}C	-	Celsius

LIST OF ABBREVIATIONS

TiO_2	-	Titanium dioxide
Al_2O_3	-	Aluminium oxide
PET	-	Polyethylenetrephthalate
PC	-	Polycarbonate
PP	-	Polypropylene
PI	-	Polyimide
PE	-	Polyester
$BaTiO_3$	-	Barium titanate
$NaNbO_3$	-	Sodium niobate
IR	-	Infrared
PNCs	-	Polymer nanocomposites
CNTs	-	Carbon nanotubes
CNFs	-	Carbon nanofibres
CB	-	Carbon black
LEDs	-	Light emitting diodes
FETs	-	Field effect transistors
EMI	-	Electromagnetic interference
Ni	-	Nickel
Au	-	Gold
Ag	-	Silver
GNPs	-	Graphene nanoplatelets
Gs	-	Graphene sheets
GO	-	Graphene oxide
FTIR	-	Fourier transform infrared spectroscopy
UV	-	Ultraviolet

XRD	-	X-ray diffraction
TGA	-	Thermogravimetric analysis
POM	-	Polarized optical microscopy
SEM	-	Scanning electron microscopy
0D	-	Zero dimensional
1D	-	One dimensional
2D	-	Two dimensional
HOPG	-	Highly oriented pyrolitic graphite
GPNCs	-	Graphene based polymer nanocomposites
LPE	-	Liquid phase exfoliation
NMP	-	N-methylpyrrolidone
DMF	-	Dimethylformamide
DMSO	-	Dimethylsulfoxide
THF	-	Tetrahydrofuran
NaCl	-	Sodium chloride
$CuCl_2$	-	Copper chloride
SDBS	-	Sodium dodecyl benzene sulfonate
SiC	-	Silicon carbide
CVD	-	Chemical vapor deposition
Ru	-	Ruthenium
Ir	-	Iridium
Co	-	Copper
Pt	-	Platinum
Pd	-	Palladium
PECVD	-	Plasma enhanced chemical vapor deposition
MW	-	Microwave
RF	-	Radio frequency

H_2SO_4	-	Sulphuric acid
HNO_3	-	Nitric acid
$KMNO_4$	-	Potassium permanganate
$KClO_3$	-	Potassium chlorate
$NaClO_2$	-	Sodium chlorite
RGO	-	Reduced graphene oxide
UHV	-	Ultra high vacuum
H_2	-	Hydrogen
N_2	-	Nitrogen
NH_3	-	Ammonia
TRGO	-	Thermally reduced graphene oxide
CO	-	Carbon monoxide
CO_2	-	Carbon dioxide
PL	-	Photoluminescence
NLO	-	Non linear optical
ClO_2	-	Chlorine dioxide
C_2F	-	Dicarbon monofluoride
GIC	-	Graphite intercalation compound
NMR	-	Nuclear magnetic resonance
PS	-	Polystyrene
PANI	-	Polyaniline
PDMS	-	Polydimethylsiloxane
PU	-	Polyurethane
PVDF	-	Polyvinylidene fluoride
N	-	Nafion
PMMA	-	Polymethylmethacrylate
xGnPs	-	Exfoliated graphite nanoplates

PVA	-	Polyvinyl alcohol
MWS	-	Maxwell-Wagner-Sillar
$SrTiO_3$	-	Strontium titanate
CEP	-	Cyanoethyl pollulan
CFGO	-	Carboxyl functionalized graphene oxide
NBR	-	Acrylonitrile butadiene rubber
FGS	-	Functionalized graphene sheets
SRG	-	Solvothermal reduction of GO
mGO	-	Modified graphene oxide
TGNPs	-	Thermally expanded graphene nanoplates
GNs	-	Graphite nanosheets
SPs	-	Syndiotactic polystyrene
GRN	-	Graphene nanosheet
TPU	-	Thermoplastic polyurethane
GNDs	-	Graphene nanodots
PVP	-	Polyvinylpyrrolidone
He-Ne	-	Helium-Neon
Nd:YAG	-	Neodymium-yttrium aluminum garnet
$Nd:YVO_4$	-	Neodymium-yttrium ortho vanadate
WAXD	-	Wide angle X-ray diffraction
HOMO	-	Highest occupied molecular orbital
LUMO	-	Lowest unoccupied molecular orbital
TG	-	Thermogravimetry
DTA	-	Differential thermal analysis
CCD	-	Charged coupled device
LaB_6	-	Lanthanum hexaboride
FE	-	Field emission

CRT	-	Cathode ray tube
LCD	-	Liquid crystal display
SE	-	Secondary electron
BSE	-	Backscattered electrons
DBSE	-	Diffracted backscattered electrons
EDAX	-	Energy dispersive X-ray spectroscopy
ESEM	-	Environmental scanning electron microscopy
ZnO	-	Zinc oxide
HPMC	-	Hydroxy propyl methyl cellulose
PPy	-	Polypyrrole
ICPs	-	Intrinsically conducting polymers
PSSA	-	Polystyrenesulfonic acid
IPN	-	Interpenetrating polymer network
PEG	-	Polyethylene glycol
V_2O_5	-	Vanadium pentoxide
PVAc	-	Polyvinyl acetate
H_3PO_4	-	Phosphoric acid
$PbTiO_3$	-	Lead titanate
Ta_5O_2	-	Tantalum dioxide
NO_2	-	Nitrogen dioxide
N_2O_4	-	Dinitrogen tetroxide