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LIST OF SYMBOLS

C_p	-	Capacitance
V	-	Voltage
Q	-	Electrical charge
ϵ	-	Dielectric constant
ϵ_0	-	Dielectric constant of free space
A	-	Surface area of the electrode
t	-	Sample thickness
$\tan\delta$	-	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_0	-	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
- $^{\circ}\text{C}$ - Celsius

LIST OF ABBREVIATIONS

TiO ₂	-	Titanium dioxide
Al ₂ O ₃	-	Aluminium oxide
PET	-	Polyethyleneterephthalate
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 pyrolytic 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 ₂ SO 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 ₂ F	- 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 ₂ O ₅	- Vanadium pentoxide
PVAc	- Polyvinyl acetate
H ₃ PO ₄	- Phosphoric acid
PbTiO ₃	- Lead titanate
Ta ₅ O ₂	- Tantalum dioxide
NO ₂	- Nitrogen dioxide
N ₂ O ₄	- Dinitrogen tetroxide