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List of Abbreviations and Symbols

| Abbreviation | Nomenclature |
|--------------|--|
| MFN | Multifunctional nanomaterial |
| GSA | Ground state absorption |
| ETU | Energy transfer Upconversion |
| UCP | Upconverting phosphors |
| UPCN | Upconverting nanophosphors |
| FANC | Fluorescence Atacamite Nanoclusters |
| SEFANC | Silica-encapsulated fluorescence Atacamite nanoclusters |
| B.F. | Bright Field |
| V.B. | Valence band |
| C.B. | Conduction band |
| SPR | Surface plasmon resonance |
| ESI-MS | Electrospray Ionization Mass Spectrometry |
| CONP | Copper oxide nanoparticle |
| W.H. | Williamson-Hall |
| CIE | International commission on Illumination |
| MTT | (3-(4,5-Dimethylthiazol-2-yl)-2,5-Diphenyltetrazolium Bromide) |
| MPMS | Magnetic Properties Measurement System |
| MRI | Magnetic Resonance Imaging |
| GC-MS | Gas Chromatography Mass Spectrometry |
| EDLC | Electrostatic double layer Capacitance |
| CV | Cyclic Voltammetry |
| EIS | Electrochemical Impedance Spectroscopy |
| ECSA | Electrochemical Active Surface Area |
| GCD | Galvanic Charge-Discharge |

Symbols Nomenclature

| | |
|-------------------|---------------------------------------|
| cps | Counts per second |
| a.u. | Arbitrary Unit |
| ns | Nano seconds |
| °C | Degree centigrade |
| IC ₅₀ | Half Maximum Inhibition Concentration |
| η | Photothermal conversion efficiency |
| I _{CP} | Cathodic peak current density |
| W/cm ² | Watt per centimetre square |
| C _s | Specific capacitance |