Appendix – I

Instruments Used

UV-Vis-NIR spectrophotometer: UV-Visible-NIR spectral measurements were carried out using JASCO V-570 model UV-Visible spectrophotometer with a resolution of 1 nm.

FTIR spectrophotometer: FTIR spectra were recorded on a Perkin Elmer Spectrum One FTIR spectrophotometer in diffuse reflectance mode, operating at a resolution of 4 cm⁻¹.

Dynamic Light Scattering: DLS measurements were carried out on Brookhaven Instrument model 90 Plus Particle Size Analyzer.

X-ray Diffraction: The diffractograms were recorded on a PANalytical Xpert Pro machine using a CuKα (λ=1.54Å) source and operating conditions of 40 mA and 30 kV at different scan rates depending upon the sample.

Transmission Electron Microscopy: Samples were characterized with Technai T-20 transmission electron microscope operated at 200kV. For high resolution images Technai T-30 instrument operated at 300 kV was used. TEM samples were prepared by coating drop casting the samples on TEM grid and allowed to dry under ambient conditions.

Scanning Electron Microscopy: SEM images of the samples were recorded using FEI Quanta environmental SEM operated at 20kV.

Surface area and Pore size/Volume analysis: BET Surface area of the samples measured using Quantachrome autosorb instrument.