

Chapter 2

Experimental

2. Experimental

2.1. Reagents

All the reagents used to conduct the experiments were of analytical grade.

1. Silver nitrate (AgNO_3) was purchased from Qualigens Fine Chemicals.
2. Cetyltrimethylammonium bromide (CTAB) was obtained from Central Drug House (P) Ltd.
3. Sodium borohydride (NaBH_4), sodium hydroxide (NaOH) and ascorbic acid were purchased from sd fine chemicals Ltd.
4. Ethanol and L-cysteine were purchased from Sisco Research Laboratories Pvt. Ltd.
5. Potassium ferrocyanide ($\text{K}_4[\text{Fe}(\text{CN})_6] \cdot 3\text{H}_2\text{O}$), copper sulfate ($\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$), phosphoric acid (H_3PO_4) and imidazole were purchased from Merck (India).
6. 4-Aminothiophenol, sodium perchlorate (NaClO_4), isonicotinic acid, bis(acetylacetonato)oxovanadium ($[\text{VO}(\text{acac})_2]$), D-(+)-glucose, hydrogen peroxide (30 wt% in H_2O), denatured herring sperm DNA, adenine, guanine, dopamine, epinephrine, penicillamine, uric acid, and poly(*N*-vinyl-2-pyrrolidone) (PVP K30) were purchased from Sigma-Aldrich (India).
7. Double distilled water was used for experimental purpose.

2.2. Instruments

All the experiments were conducted at room temperature 25°C.

1. All electrochemical measurements were performed with a CHI 660C Electrochemical workstation (CH Instrument, USA). A conventional three electrode system was employed, which consisted with a gold or modified gold electrode as working electrode (2 mm diameter, 0.031 cm² area), Pt wire as a counter electrode and Ag/AgCl (3 M KCl) as reference electrode.
2. Absorption spectra were recorded on a Shimadzu UV-3101PC spectrophotometer taking the sample in 1 cm well-stoppered quartz cuvette.
3. Transmission electron microscopy (TEM) images were obtained using JEM-100CX, Jeol. Selected area electron diffraction (SAED) pattern were obtained using the same instrument. Samples were prepared by placing a drop of solution on a carbon coated copper grid and allowing the grids to be dried overnight under vacuum.
4. The field emission scanning electron microscopy (FE SEM) images, elemental mapping images and energy dispersive X-ray (EDAX) analysis data were obtained using FE-SEM, FEI INSPECT F50 operated at an acceleration voltage of 20 kV.
5. Fourier transform infrared spectra (FTIR) were recorded on a Shimadzu 8400S spectrometer.