

Supplementary information

Facile green synthesis of silicon nanoparticles from *Equisetum arvense* for fluorescence based detection of Fe(III) ions

T. V. S. Adinarayana,^a Ayushi Mishra,^b Ishu Singhal*^b and D. V. Rama Koti Reddy^a

^a Department of Instrument Technology, Andhra University College of Engineering, Andhra University, Andhra Pradesh, India

^b School of Biotechnology, Jawaharlal Nehru University, New Delhi, India

*Corresponding Authors: ishu_singhal@yahoo.com

1 Electrochemical Characterization

1.1 CV Characteristics

The synthesized SiNPs were characterized using the cyclic voltammetric technique in 5 mM Ferri-Ferro solution containing 0.25 M KCl. Electron transfer kinetics of Ferri-Ferro redox probe were studied and is dependent on the surface interface of electrode/electrolyte. Fig. S1 shows the CV characteristics of SiNPs within the scan rate ranging from 10 mV/s to 100 mV/s. The diffusion coefficient is calculated using the Randles-Sevcik equation, which is $6.44 \times 10^{-6} \text{ cm}^2/\text{s}$. The capacitance variation ranges from 256 μF to 100 μF with the variation in the scan rate from 10 mV/s to 100 mV/s, which is shown in Fig. S2.

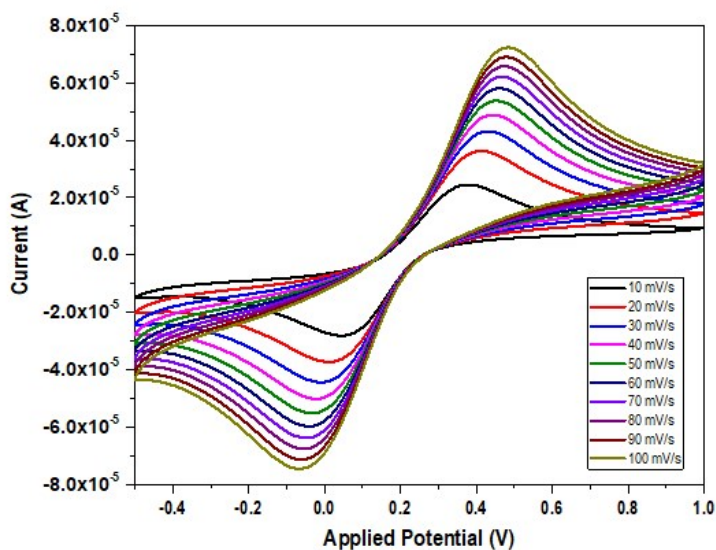


Fig. S1. CV characteristics probed electrochemically of the synthesized SiNPs.

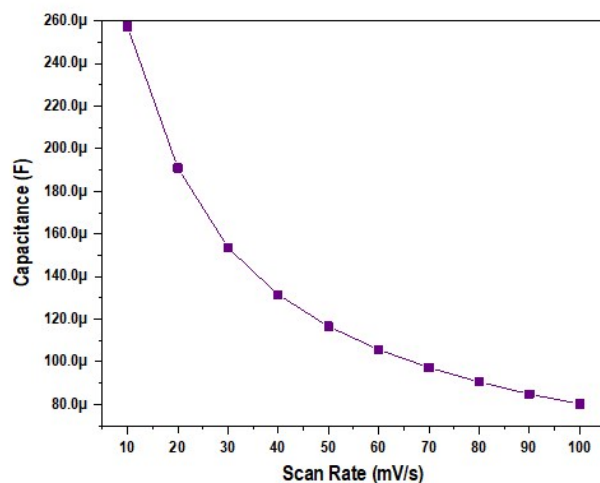


Fig. S2. Capacitance characteristics with respect to a scan rate of the synthesized SiNPs.

1.2 FRA Characteristics

Fig. S3 shows impedance of SiNPs in 0.1M KCl solution containing Ferro-Ferri counter ions, by sweeping the frequencies from 105 to 0.1 Hz and respective Randel's equivalent circuit (inset). The impedance diagrams were interpreted concerning the combined effect of the charge transfer resistance, R , of the sample, i.e. SiNPs and a constant phase conductance in parallel. The Resistance values were given by the difference between the impedance arrests at high and low frequencies, the latter corresponding to the ohmic resistance of the solution.

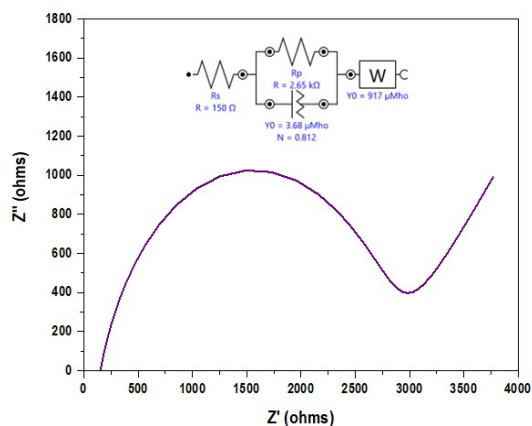


Fig. S3. FRA characteristics of the synthesized SiNPs.