Supporting information

Well-Designed Construction of Yttrium Orthovanadate Confined on Graphitic Carbon Nitride Sheets: Electrochemical Investigation of Dimetridazole

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Chemicals and reagents

Yttrium(III) nitrate ($Y(NO_3)_3$), ammonium metavanadate (NH_4VO_3), melamine, dimetridazole (DMZ), urea, sodium hydroxide (NaOH) and all the chemicals used in the study are of analytical grade and are received from Sigma-Aldrich & Merck, Alfa Aesar and Showa Chemical Industry Co., Ltd. Ultrapure fresh water is obtained from a millipore water purification system (Milli-Q, specific resistivity > 18 MΩcm, S.A.; Molsheim, France) and is used in all the experiments. Sodium phosphate dibasic and sodium dihydrogen phosphate (Na_2HPO_4 and NaH_2PO_4) are utilized to prepare 0.1 M (pH 7) PB (phosphate buffer). All the electrochemical experiments are carried out using 0.1 M PB (pH 7) as the supporting electrolyte.

Instrumentation and methods

Phase configuration is identified using X-ray diffraction analysis (XRD) (Bruker (XRD, Rigaku D/maxB, DMX-2200)) instrument. Perkin Elmer spectrometer is employed to record Fourier transform infrared spectra in the range of 400-4000 cm^{-1}. X-ray photoelectron spectroscopy (XPS) analysis (PHI 5000 Versa Prob II, FEI Inc.) is applied to quantitatively analyse the chemical composition of the materials. The surface morphology and the elemental composition are studied utilizing high resolution (HR) transmission electron microscopy (TEM) (H-7600, Hitachi-Japan) operating at 200 kV and energy dispersive X-ray spectroscopy by using JOEL Serive Advanced Technology. By utilizing these characterization methods, the physical properties of the as-prepared YVO_4@CN nanocomposite are investigated. The electrochemical properties are explored using electrochemical impedance spectroscopy (EIS) through Autolab (PGSTAT101). CHI 1211c electrocatalytic workstation is functional to carry out the electrochemical measurements like cyclic voltammetry (CV) and amperometry *i*–t in a conventional three electrode cell. Here, the modified GCE (surface area = 0.072 cm^2), saturated Ag|AgCl and Pt wire are active as working, reference and counter electrodes, respectively.

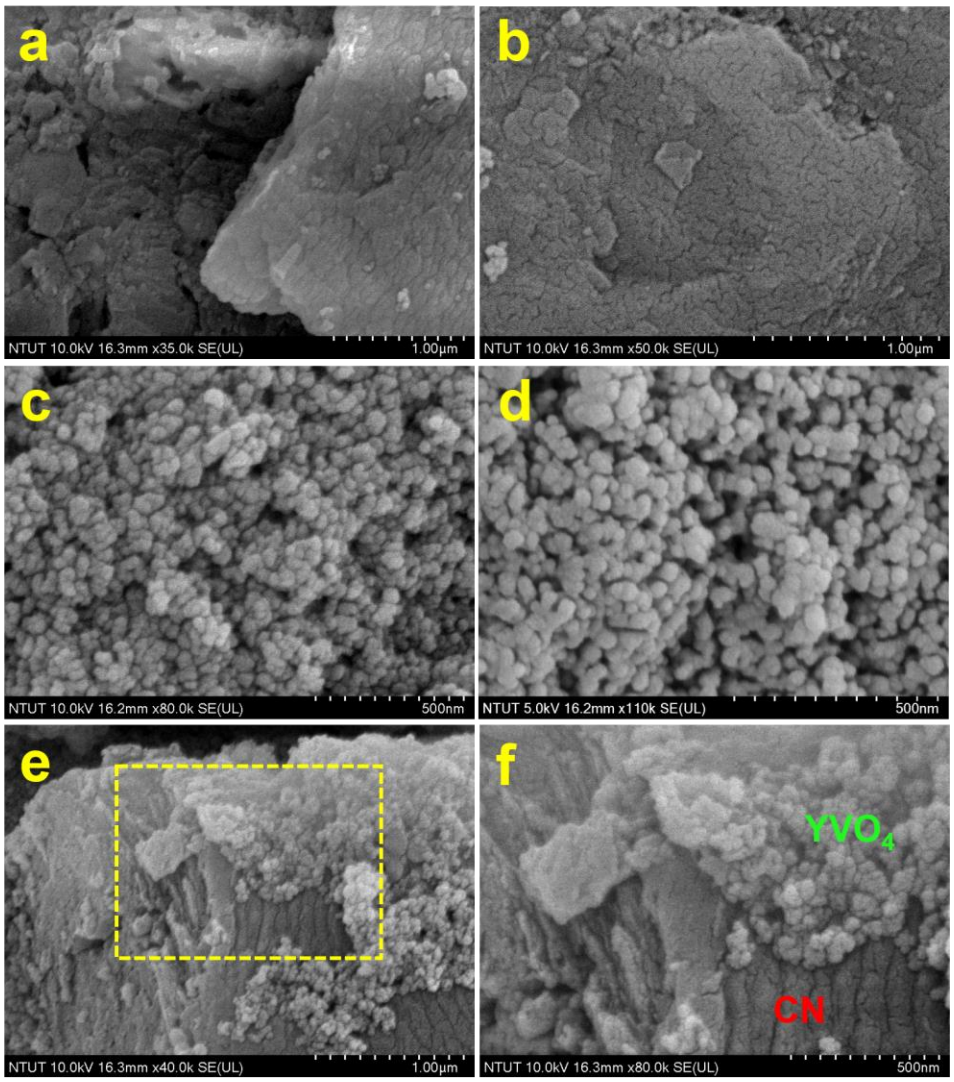

Figure S1. (a, b) FE-SEM images of CN sheets, **(c, d)** YVO_4 nanosphere and **(e, f)** YVO_4@CN nanocomposite.

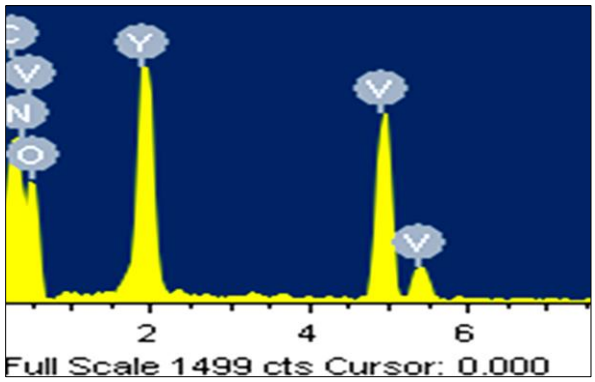

Figure S2. EDX spectrum of YVO_4@CN composite.

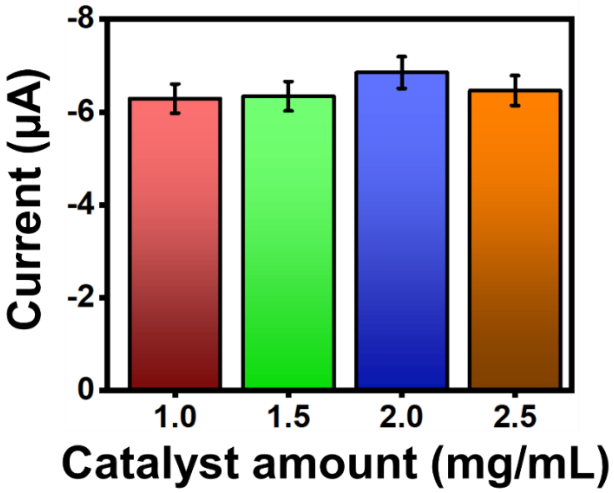

Figure S3. Effect of YVO_4@CN catalyst preparing amount (1 → 2.5 mg/mL) with the presence of 50 μM DMZ in 0.1 M PB (pH 7.0) at a scanning rate of 50 mV s^{-1}.

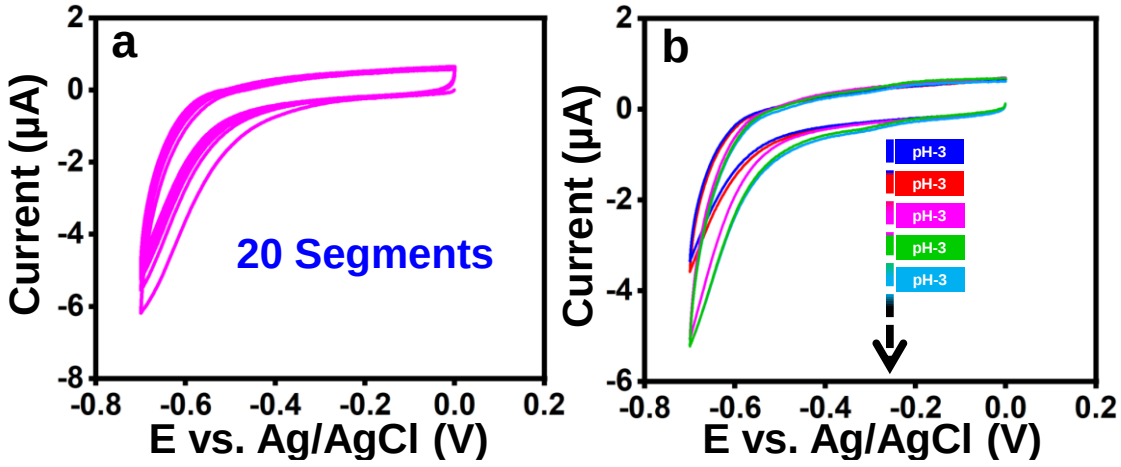

Figure S4. (a) Cycle stability of YVO_4@CN/GCE composite without presence of DMZ. **(b)** Effect on different pH capacitive current of YVO_4@CN.

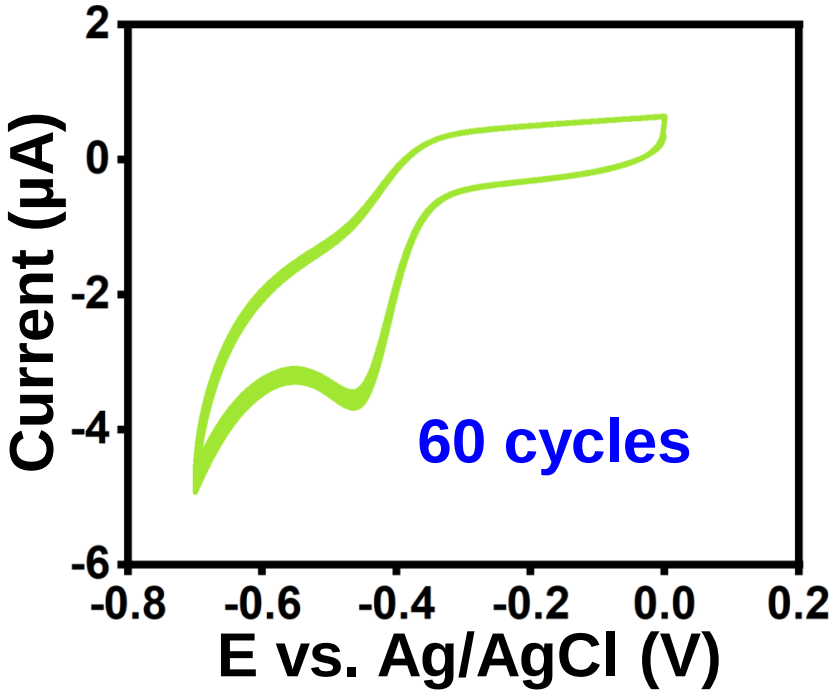

Figure S5. Cycle stability of YVO_4@CN composite in the presence of DMZ.

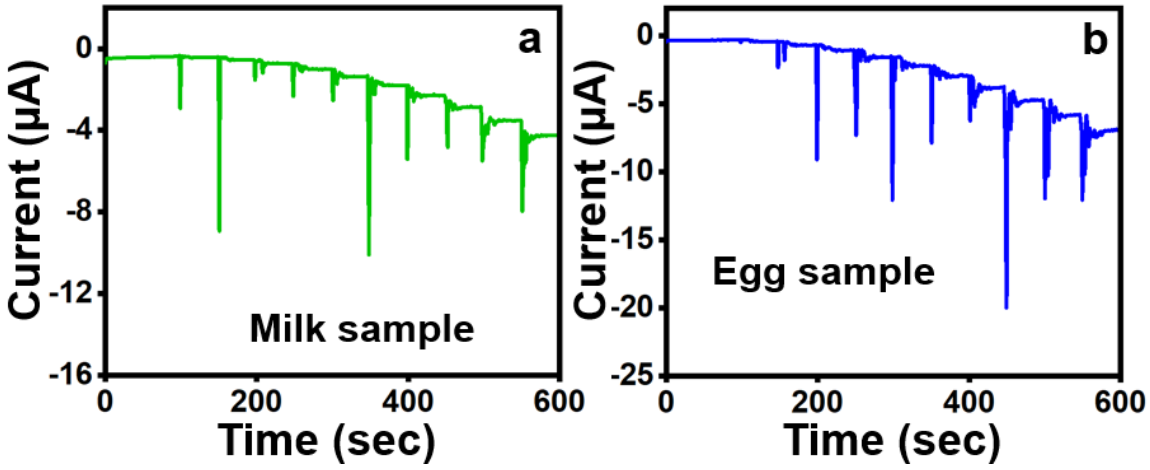

Figure S6. Real-sample analysis of DMZ in **(a)** milk and **(b)** egg samples.