Electronic Supplementary Material (ESI) for RSC Advances

Supporting information for

Fabrication of conducting polypyrrole/β-cyclodextrin nano- and micro-spheres using molecular templates

Songmin SHANG*, Wei ZENG, Xiao-ming TAO

Institute of Textiles and Clothing, The Hong Kong Polytechnic University, Hong Kong

E-mail: tcshang@inet.polyu.edu.hk

SEM analyses of $FeCl_3$/pyrrole composites

In general, the oxidative polymerization of pyrrole is a function of the monomer and oxidant concentrations, solvent, reaction time and temperature, and the optimum molar ratio of $FeCl_3$/pyrrole for the polymerization of pyrrole by $FeCl_3$ has been suggested to be approximately 2.33:1(S. P. Armes, Synth. Met., 1987). We had investigated the effect of $FeCl_3$ content on morphological of the PPy/β-CD composites by using a $FeCl_3$/pyrrole molar ratio of 2.33:1. Figure S1 revealed that the sample was composed of the nano- and micro-sphere and irregular particle, and the products should be a mixture of both pure PPy particles and PPy/β-CD spheres.

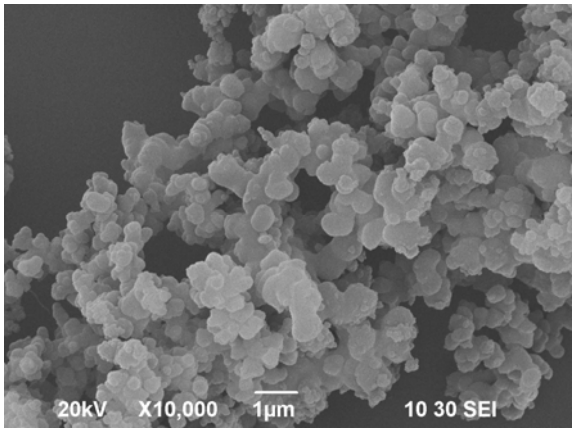

Figure S1. The SEM images of PPy/β-CD composites

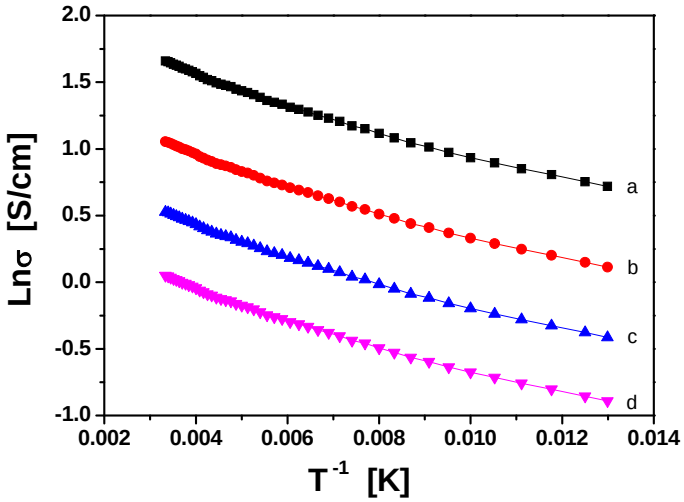

Figure S2. Plots of *Lnσ* as functions of T^{-1}. (a) PPy particals, and the prepared conducting PPy/β-CD spheres with different amount of β-CD, (b) 1.0 mmol, (c) 2.0 mmol, and (d) 2.5 mmol.

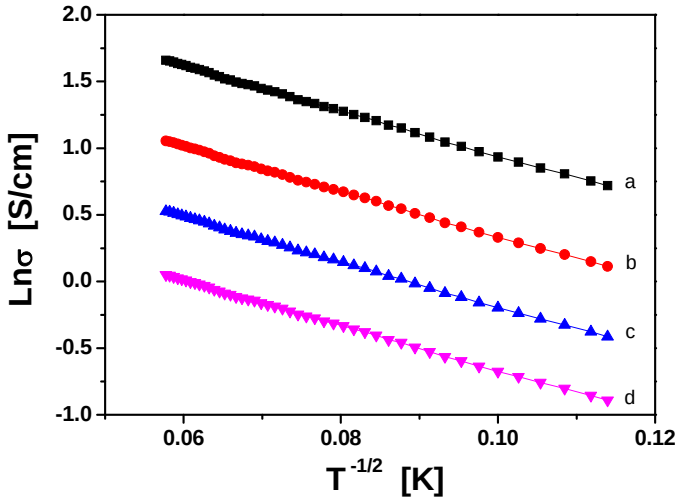

Figure S3. Plots of $Ln\sigma$ as functions of $T^{-1/2}$. (a) PPy particals, and the prepared conducting PPy/β-CD spheres with different amount of β-CD, (b) 1.0 mmol, (c) 2.0 mmol, and (d) 2.5 mmol.

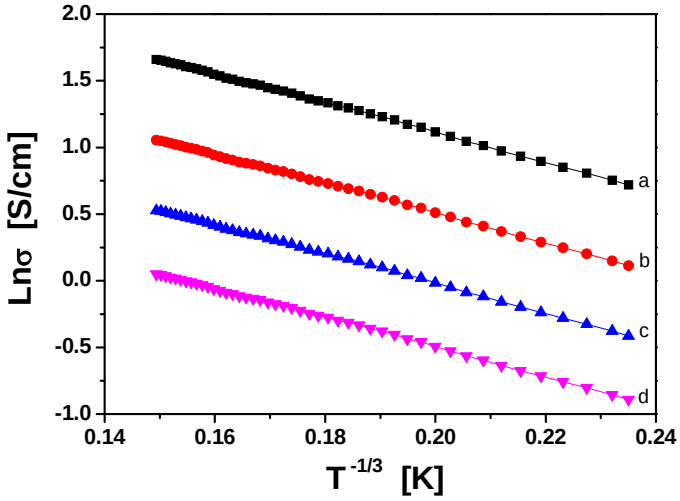

Figure S4. Plots of $Ln\sigma$ as functions of $T^{-1/3}$. (a) PPy particals, and the prepared conducting PPy/β-CD spheres with different amount of β-CD, (b) 1.0 mmol, (c) 2.0 mmol, and (d) 2.5 mmol.