

## Supplementary Information

### Facile synthesis of Pd nanostructures in hexagonal mesophases as promising electrocatalyst for ethanol oxidation

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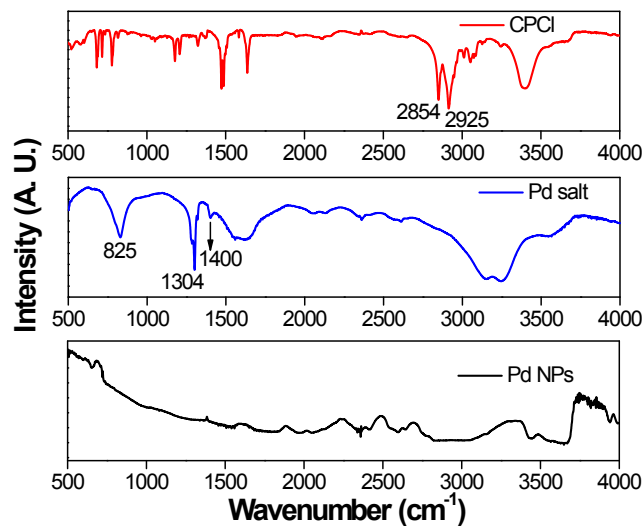
**Figure S1** FTIR spectra of surfactant, Pd complex and Pd nanoparticles synthesized in hexagonal mesophases.

**Figure S2** (a) Polarized light micrograph of pure mesophases in the presence of 0.1 M NaCl, (b) Polarized light micrograph of doped mesophases with 0.1 M Pd complex, (c) and (d) Pd complex doped mesophases after 12 and 24 hours photo irradiation respectively. After photo reduction of Pd complex, Pd nanostructures shows a large degree of preservation of the birefringent pattern indicative of the stability of hexagonal LC phase.

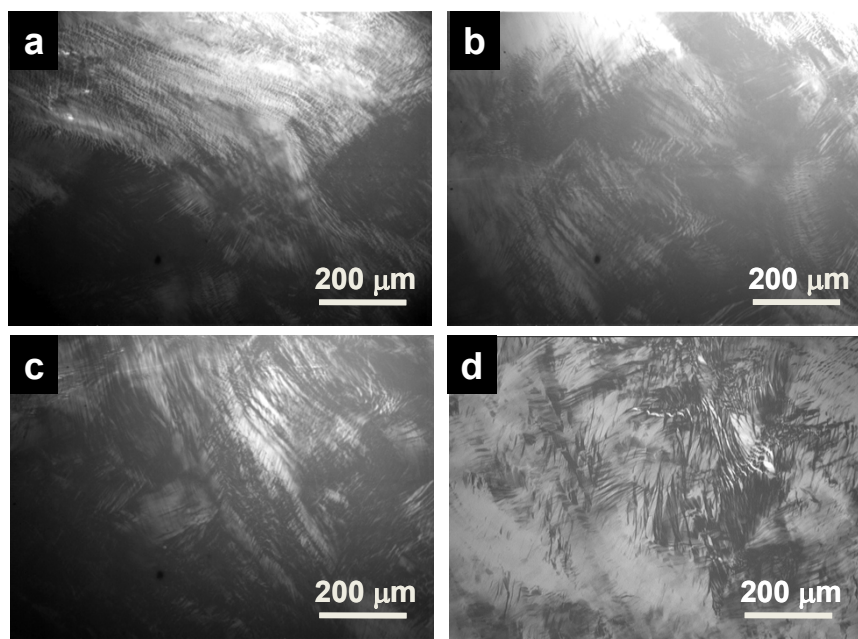
**Figure S3** Transmission electron micrographs of Pd nanostructures synthesized in hexagonal mesophases by 5 hrs UV-irradiation.

**Figure S4** (a-b) higher resolution transmission electron micrographs and (c) layered morphologies RGO nanosheets synthesized by gamma-irradiation.

**Figure S5** Cyclic voltammograms of reduced RGO nanosheets in 1M NaOH (black solid line curve) and with the electrocatalytic oxidation of 1 M EtOH in 1 M NaOH (red solid line). The working electrode was a glassy carbon disk modified with the RGO Pd nanosheets. The reference electrode was an Hg/HgO (1 M KOH) electrode. The scan rate was 50 mVs<sup>-1</sup>.

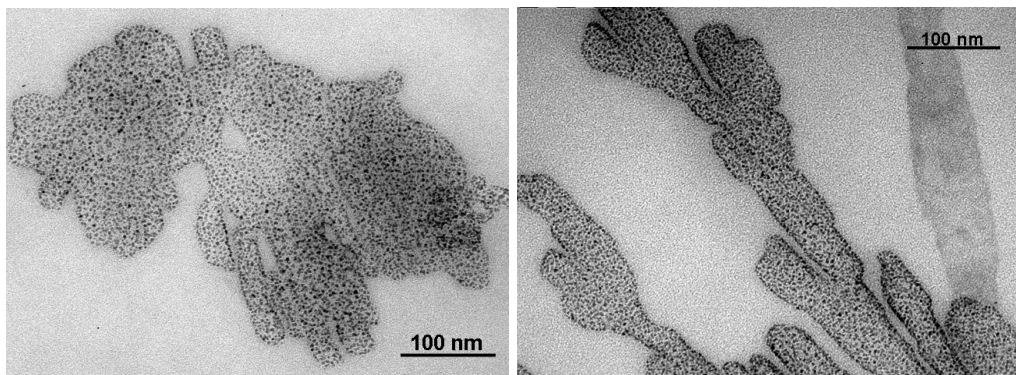


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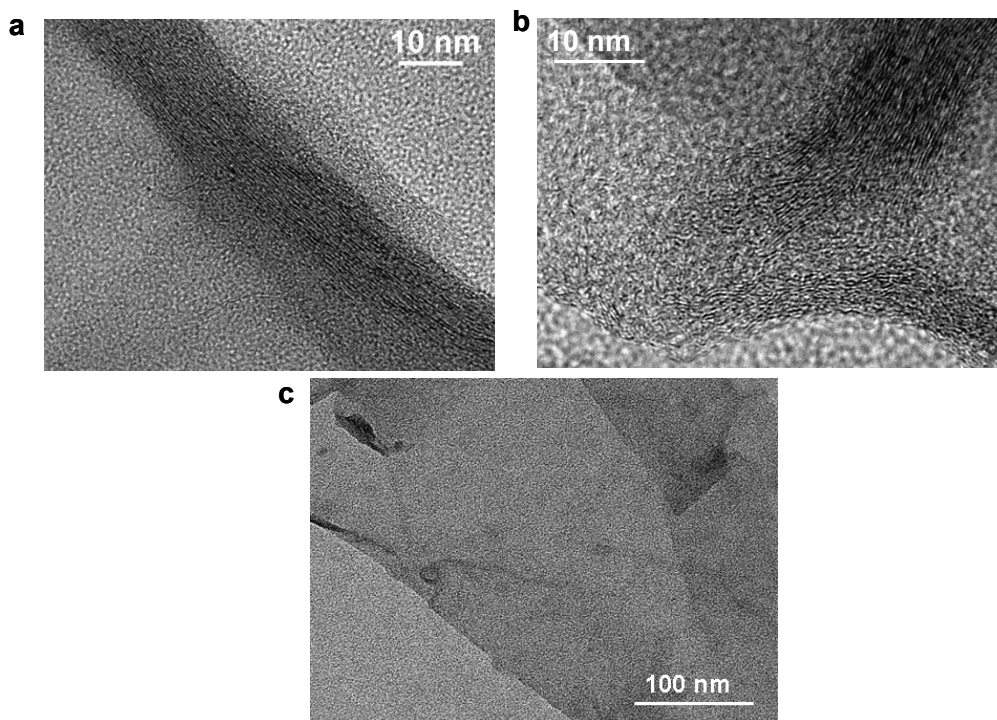


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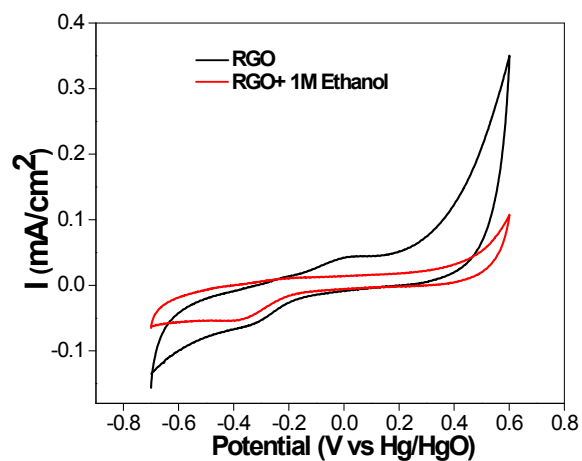
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