Electronic Supplementary Information (ESI) for

Porous Palladium Coated Conducting Polymer Nanoparticles for Ultrasensitive Hydrogen Sensors

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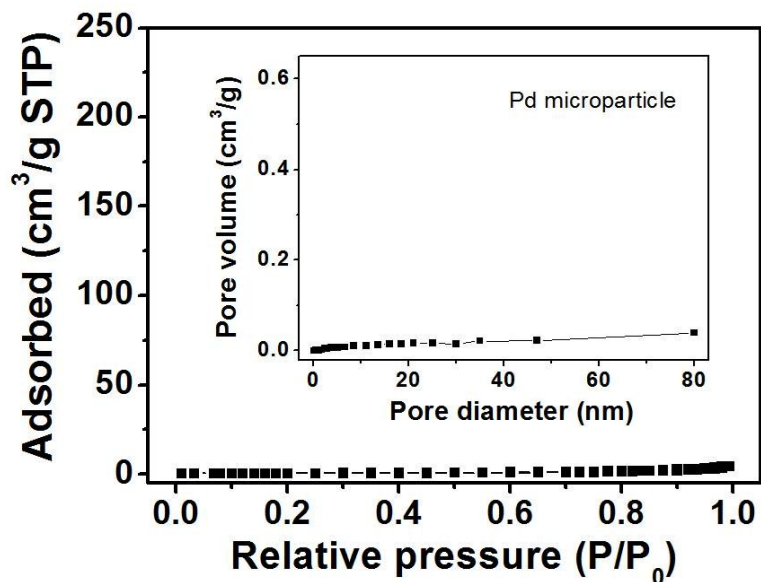# 1. BET surface area and BJH pore distribution of palladium architectures without CPPyNPs

Figure S1. Nitrogen adsorption-desorption isotherm and pore size distribution curves (inset) of palladium architectures without CPPyNPs.

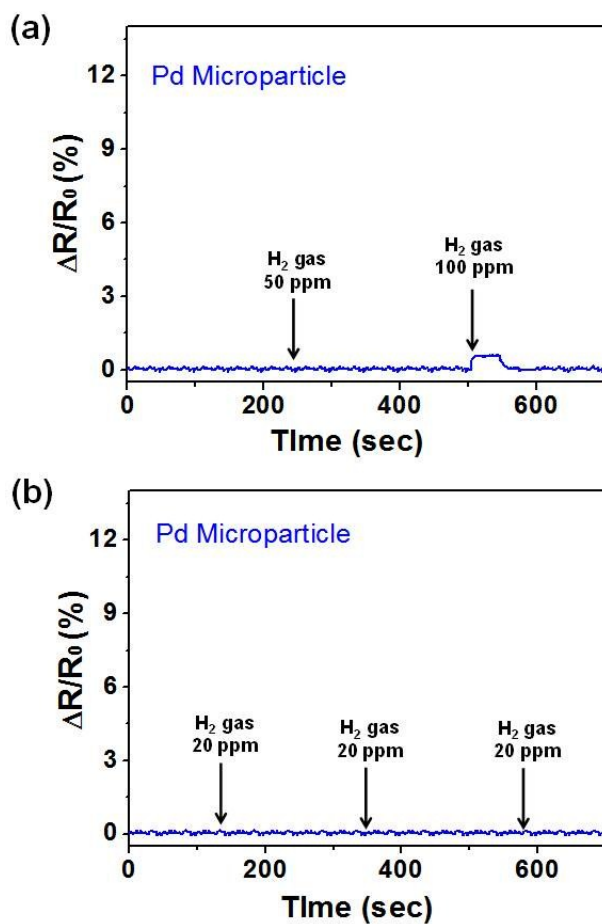## 2. Hydrogen sensing ability of palladium architectures without CPPyNPs

Figure S2. Normalized resistance changes upon (a) sequential exposure to various concentrations of hydrogen and (b) periodic exposure to 20 ppm of hydrogen gas of the palladium architectures without CPPyNPs.

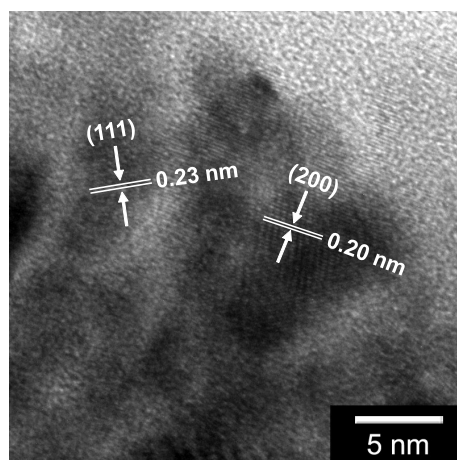**3. HR-TEM image of Pd@CPPy_C16 after 100 cycle exposure of H$_2$**

Figure S3. HR-TEM image of Pd@CPPy_C16 after 100 cycle exposure of H$_2$ gas sensing.