

Supporting Information

The effect of a metallic Ni core on charge dynamics in CdS sensitized-p-type NiO nanowire mesh photocathodes

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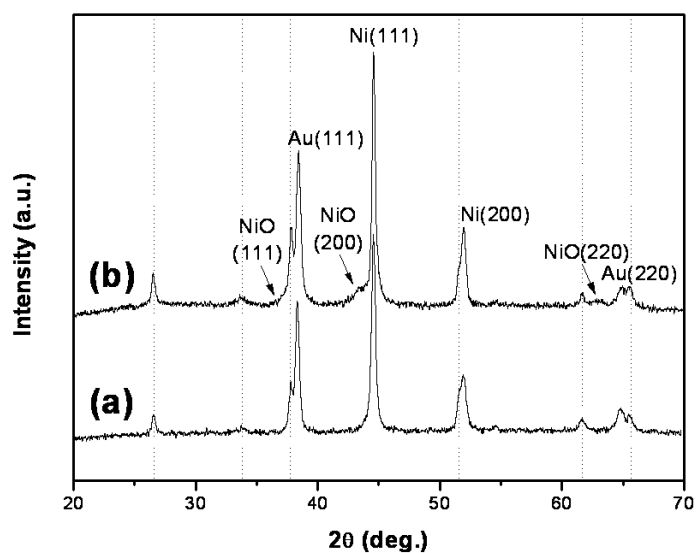


Figure S1. XRD spectrum of (a) Ni and (b) Ni core-NiO shell inverse opal nanowire mesh electrode. The vertical dot line indicates the peaks from the FTO substrate.

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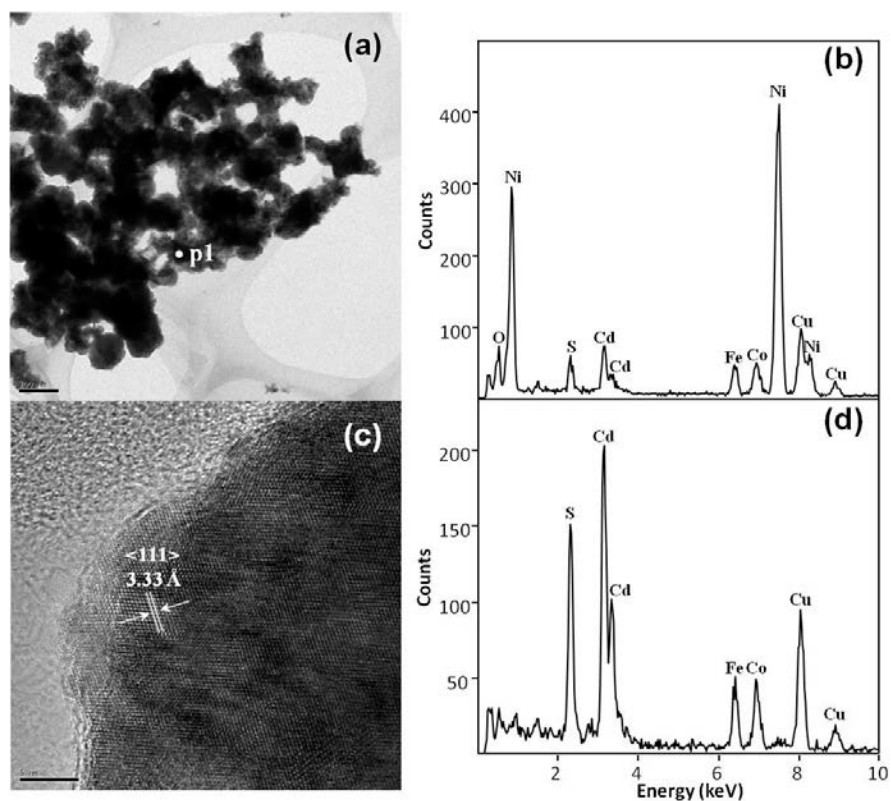


Figure S2. TEM image of (a) Ni-NiO core-shell nanowire mesh coated with CdS layer, (b) EDS result of point 1 in the average large area, (c) high-resolution TEM image of (a) region focusing on the outer part, and (d) EDS result of (c) region.

Figure S2 shows the TEM images of CdS-sensitized Ni-NiO core-shell nanowire mesh electrode. The spot like CdS sensitizer was uniformly deposited through the whole surface region. The EDS analysis of point 1 (Fig. S2b) shows that the surface region contains the chemical elements of Cd and S as well as Ni and O. The latter two elements exhibit more intense diffraction peaks from middle of the Ni-NiO core-shell structure where the CdS would be thinnest and shield diffraction from Ni and O would be the least.

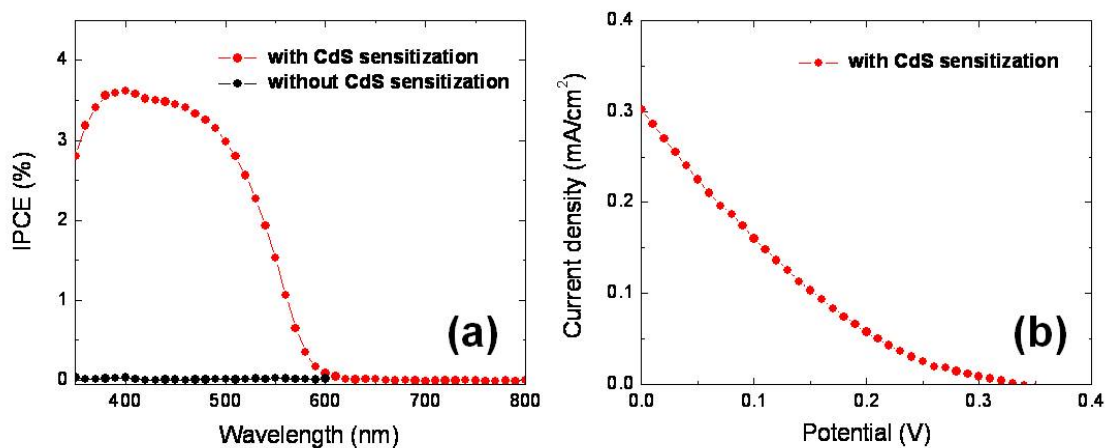


Figure S3. IPCE spectra (a) and J - V curve (b) of CdS-sensitized Ni-NiO core-shell inverse opal nanowire mesh film in polysulfide electrolyte. Also shown in (a) is the core-shell structure without CdS.

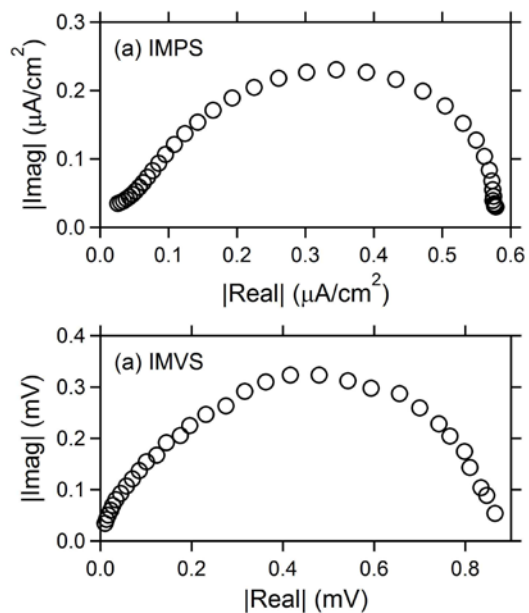


Figure S4. Typical (a) IMPS and (b) IMVS responses in the complex plane for the CdS-sensitized Ni-NiO core-shell inverse opal nanowire mesh photocathode.