Supporting Information For

Hierarchical NiO Hollow Microspheres Assembled by Nanosheet-stacked Nanoparticles and Their Application in Gas Sensor

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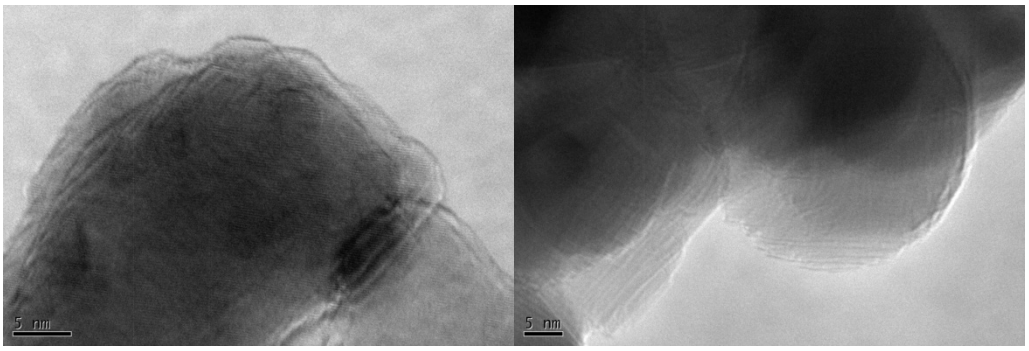

Figure S1. HRTEM images of the nanoparticles in NiO hollow microspheres showing that they are actually composed by the stacking of nanosheet building blocks.

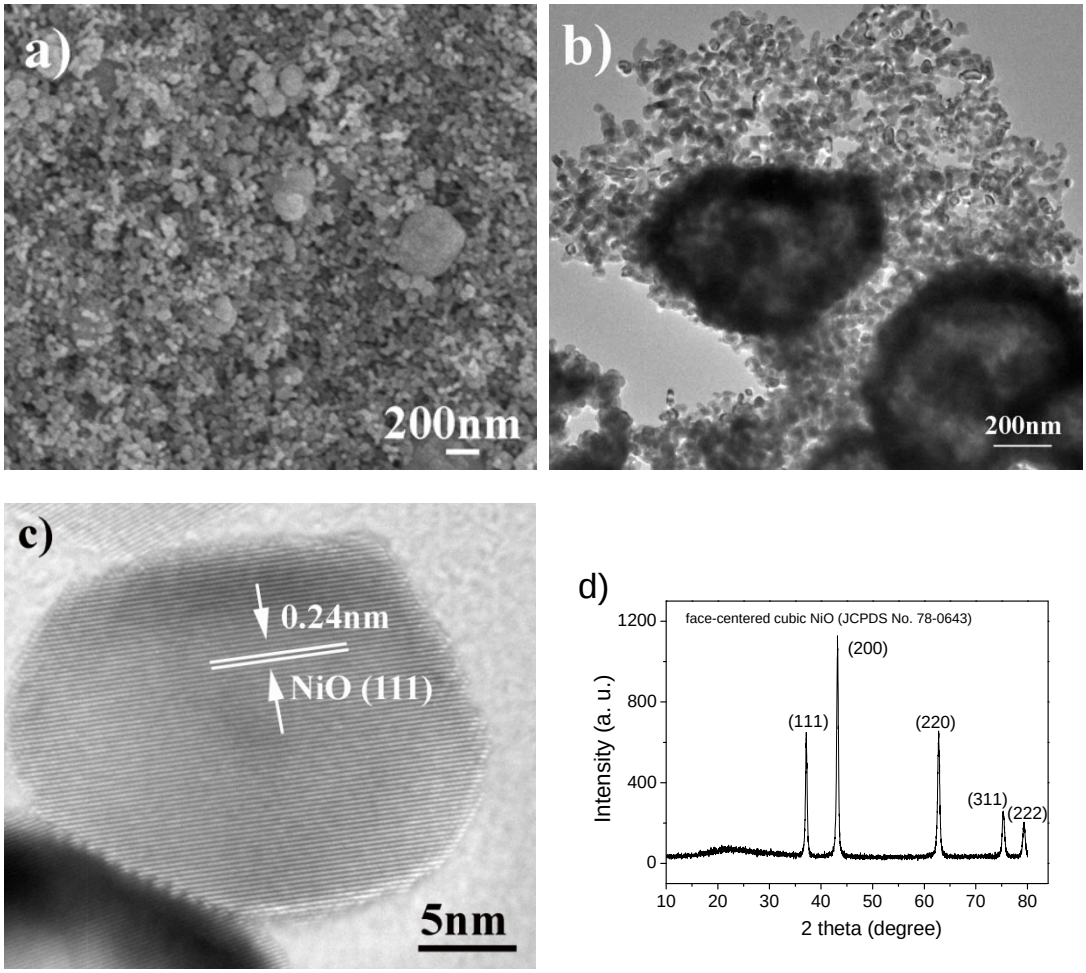

Figure S2. (a) SEM, (b) TEM, and (c) HRTEM images of as-synthesized NiO nanoparticles for comparison. The obtained NiO nanoparticles have diameter of 20-35 nm. Some of them are also assembled into hollow spherical structures. (d) The XRD pattern of NiO nanoparticles suggesting their cubic phase.

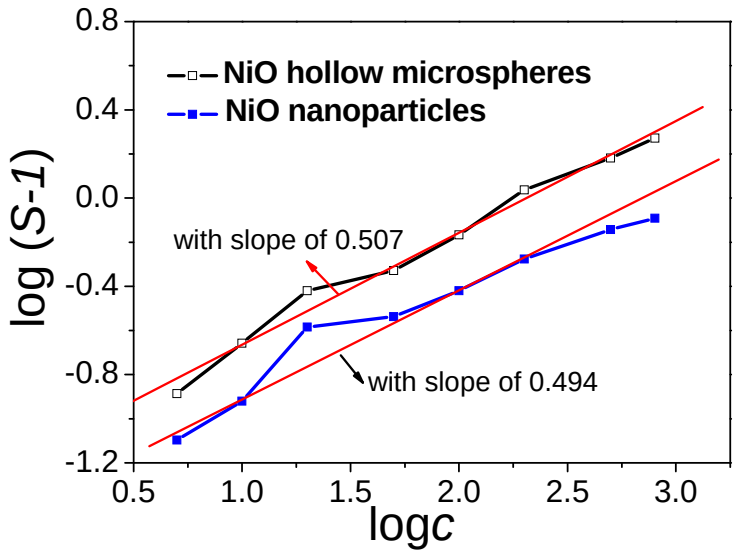

Figure S3. The plots between logarithm of gas responses (**log*(S-1)***) and logarithm of target gas concentrations (**log*c***) for the two sensors to butanol and the corresponding slopes fitted from the plots are 0.507 and 0.494, respectively.

The response of oxide semiconductor sensor to gas is usually empirically depicted as $S = 1+AP_g^{\beta}$, where P_g is the target gas partial pressure that is proportional to its concentration (c). A is a constant. The value of β takes usually 1 or 1/2. Thus,

$P_g = k\,c$, where k is a constant.

$S-1 = A\,(kc)^{\beta}$

$\log(S-1) = \log[A(kc)^{\beta}] = \log A + \beta\log(kc) = \log A + \beta\log k + \beta\log c$

From the plot of **log(*S-1*)** to **log*c***, β can be easily calculated by the slope. As shown in Figure S3, the slopes fitted from the corresponding plots of **log*(S-1) to* log*c*** for the two sensors are 0.507 and 0.494, suggesting that the value of β takes 1/2 in our cases.