

## Supplementary Information

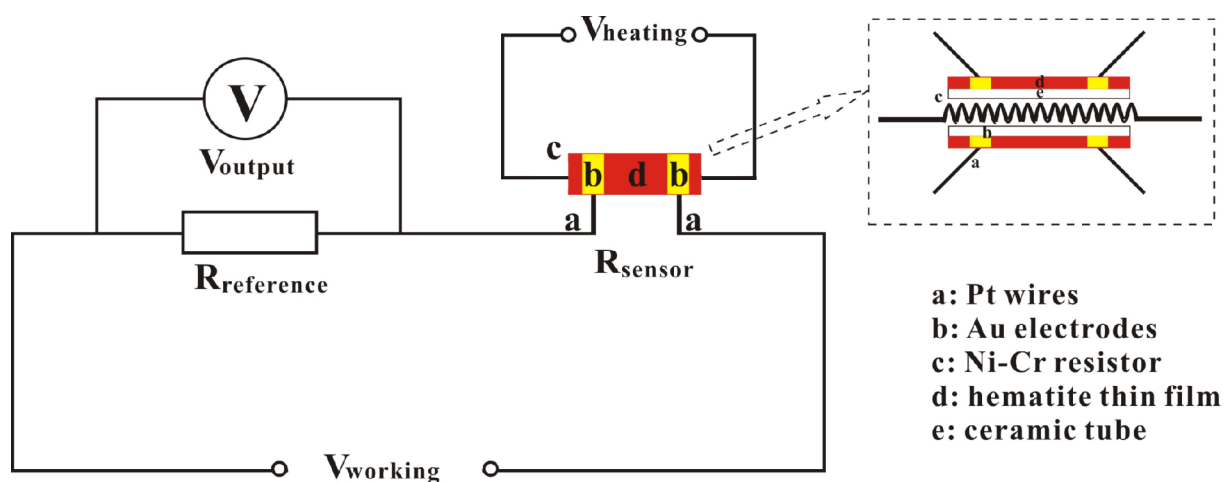
### Single-Crystal-Like Hematite Colloidal Nanocrystal Clusters: Synthesis and Applications in Gas Sensor, Photocatalysis and Water Treatment

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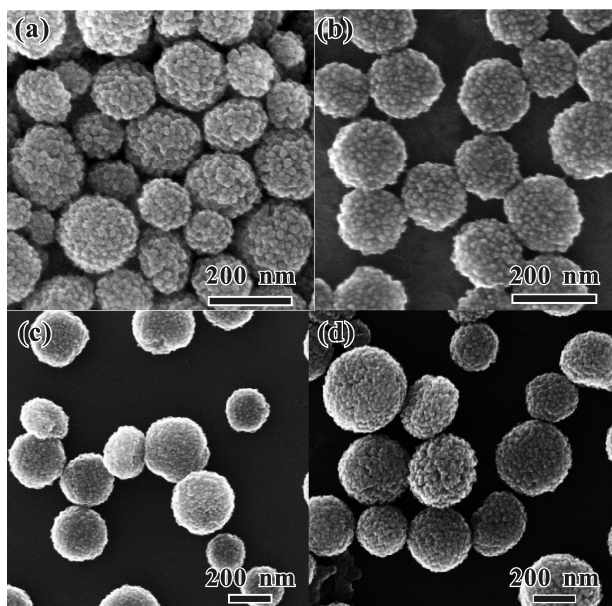
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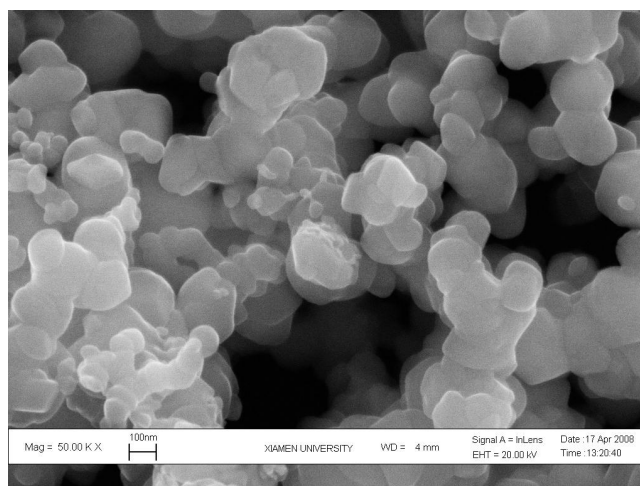


**Figure S1.** A schematic illustration of the gas sensor measurement system, the dash pane insert is the illustrations of the gas sensor.



**Figure S2.** SEM images of various spherical hematite CNCs synthesized under different solvent conditions:

- (a)  $\text{FeCl}_3$  54 mg, urea 24mg, THF/ethanol 1:1, PVP 80 mg;
- (b)  $\text{FeCl}_3$  54 mg, urea 24mg, THF/ethanol 1:1, PVP 160 mg;
- (c)  $\text{FeCl}_3$  54 mg, urea 24 mg, THF/ethanol 1:2, PVP 100 mg;
- (d)  $\text{FeCl}_3$  54 mg, urea 24 mg, THF/ethanol 1:4, PVP 100 mg.



**Figure S3.** SEM image of the  $\alpha\text{-Fe}_2\text{O}_3$  commercial powder