

Electronic Supporting Information

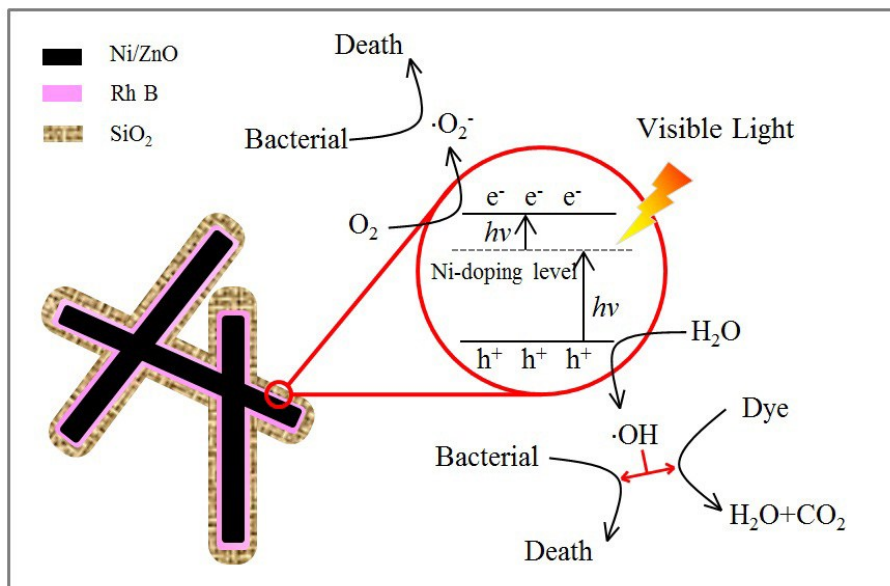
Glucose-Assisted Transformation from Ni-Doped- ZnO@Carbon to Ni-Doped-ZnO@Void@SiO₂ Core-Shell Nanocomposite Photocatalyst

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Table S1. Textural properties of typical samples Ni-ZnO@C-3 and Ni-ZnO@void@SiO₂.

Sample	S _{BET} (m ² g ⁻¹)	V _{BJH} (cm ³ g ⁻¹)	Pore size (nm)
Ni-ZnO@C-3	46.060	0.174	7.6
Ni-ZnO@void@SiO ₂	98.536	0.297	106.2



Scheme S1. Photocatalytic mechanism of the Ni/ZnO@void@SiO₂ NRs under visible light.

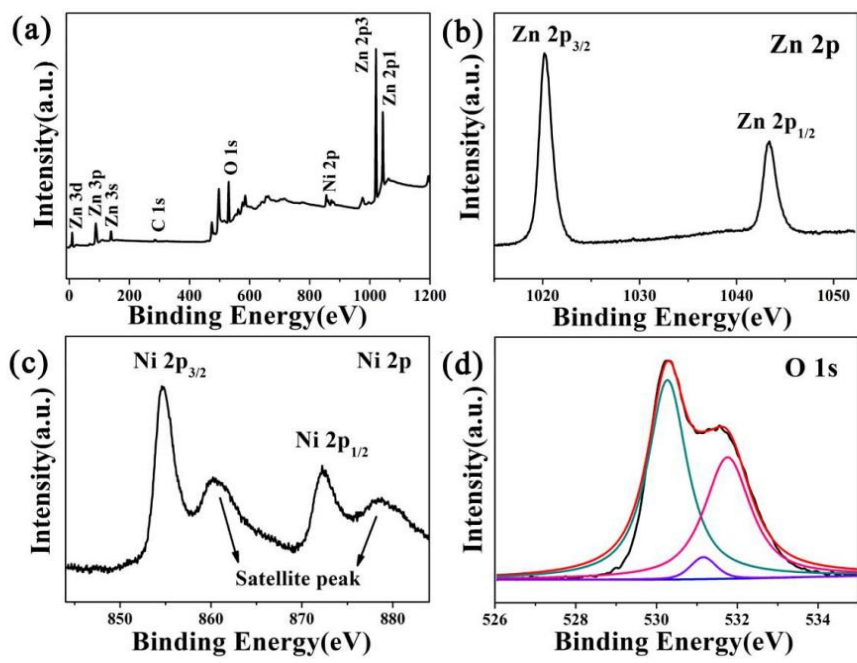


Figure S1. XPS spectra of 1 mol% Ni-ZnO nanocrystals: (a) survey spectrum, (b), (c) and (d) high-resolution binding energy spectra of Zn 2p, Ni 2p and O 1s, respectively.

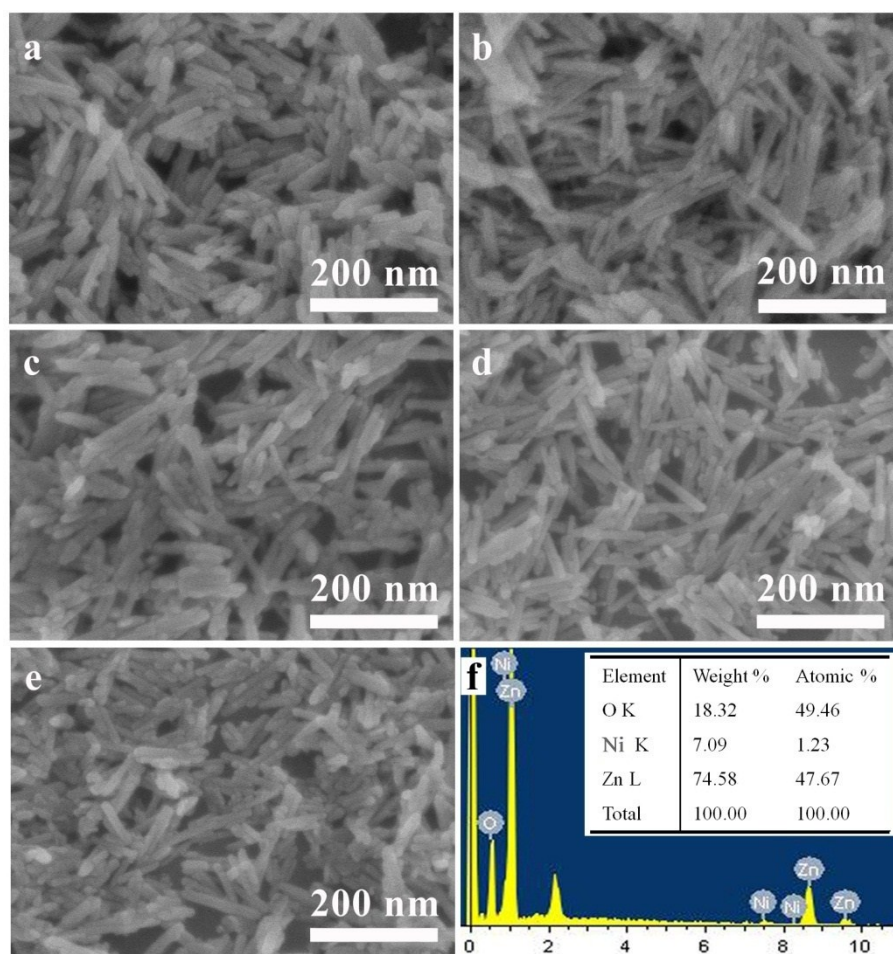


Figure S2. SEM images of the as-prepared (a) ZnO NRs and (b-e) Ni/ZnO NRs with different nickel doping content: (b) 0.5 mol%, (c) 1 mol%, (d) 2 mol%, (e) 3 mol%. (f) EDS pattern of the 3mol% Ni/ZnO sample.

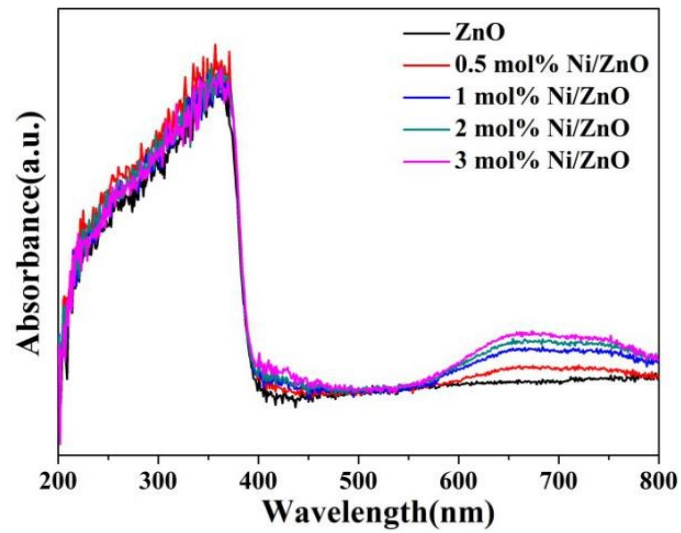


Figure S3. UV-vis diffuse reflection spectra of ZnO and Ni-doped ZnO NRs with different doping contents.

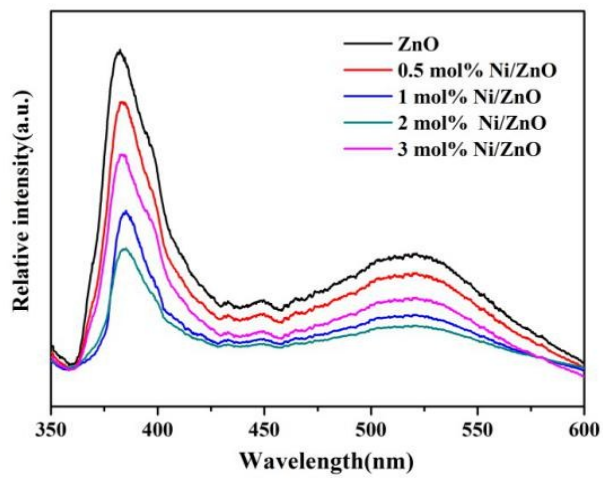


Figure S4. Photoluminescence spectra of pure ZnO and Ni/ZnO NRs with different nickel doping contents.

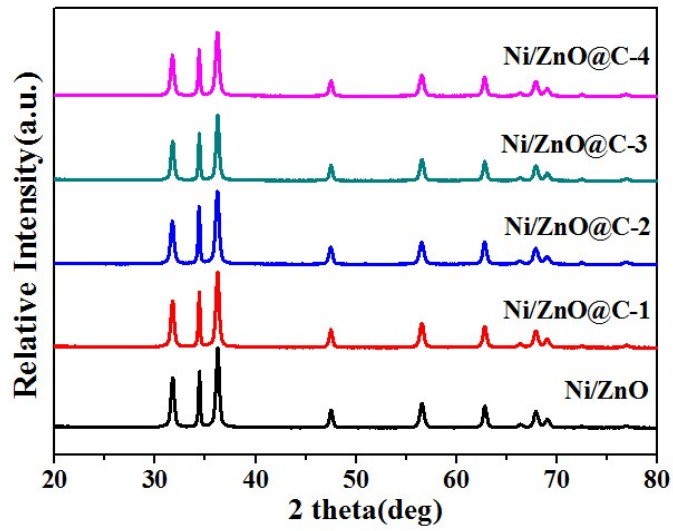


Figure S5. XRD patterns of the as-prepared Ni/ZnO NRs and Ni/ZnO@C core-shell NRs prepared with different amounts of glucose.

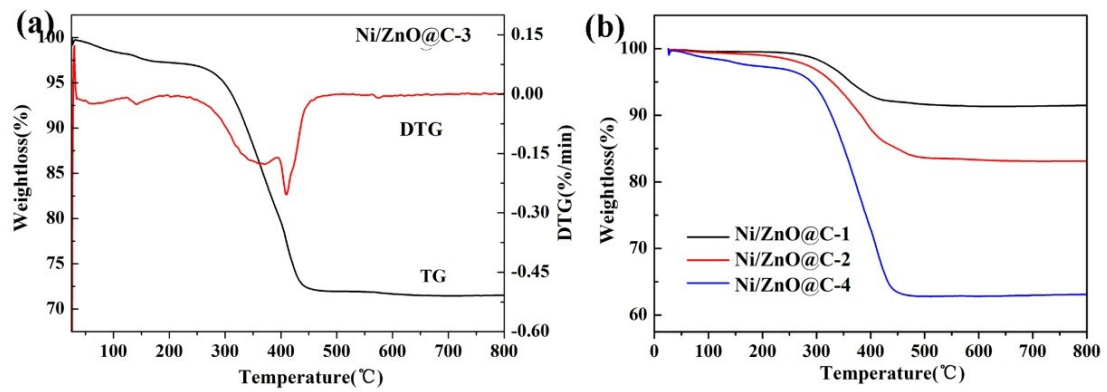


Figure S6. Thermogravimetric analysis of the Ni/ZnO@C core-shell NRs.

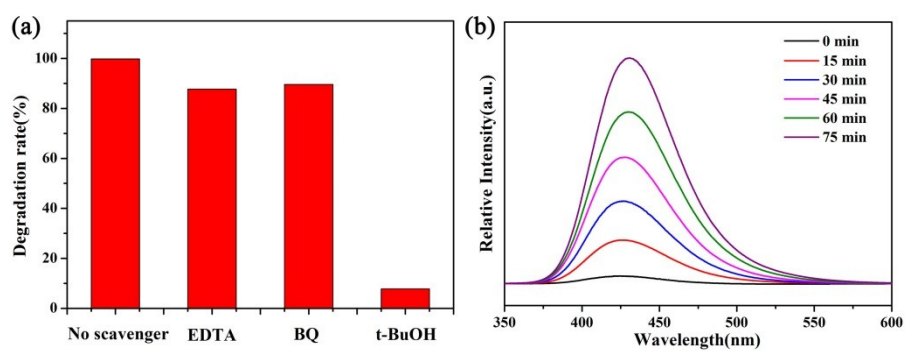


Figure S7. (a) Detection of ROS species with different scavengers in the degradation of RhB solutions under visible light; (b) Time-dependent PL spectrum of $\cdot\text{OH}$ radical by fluorescence method using terephthalic acid as trapping reagent.

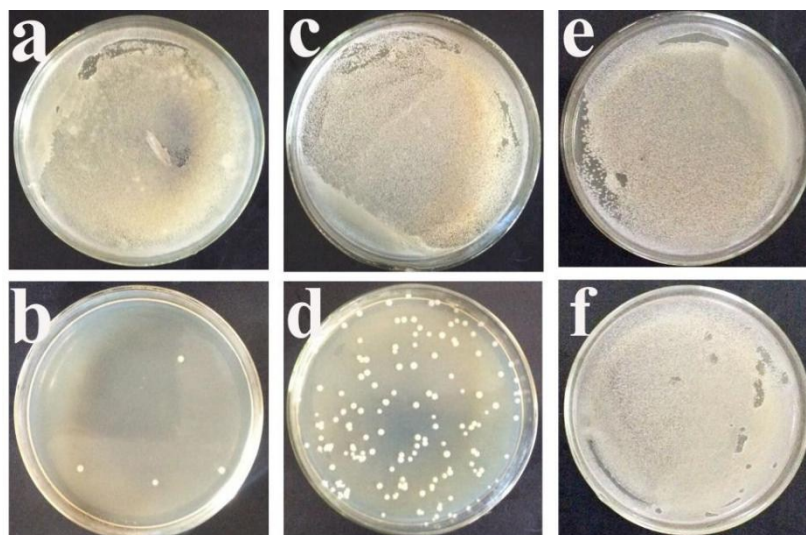


Figure S8. Detection of $\cdot\text{OH}$ in photocatalytic antibacterial tests of Ni/ZnO@void@SiO_2 by addition of (a, b) 0.01 mmol and (c, d) 0.05 mmol of KBrO_4 , respectively. (e, f) control tests only adding 0.05 mmol of KBrO_4 without photocatalyst. (a, c and e) in dark condition. (b, d, f) under visible light irradiation for 20 min.

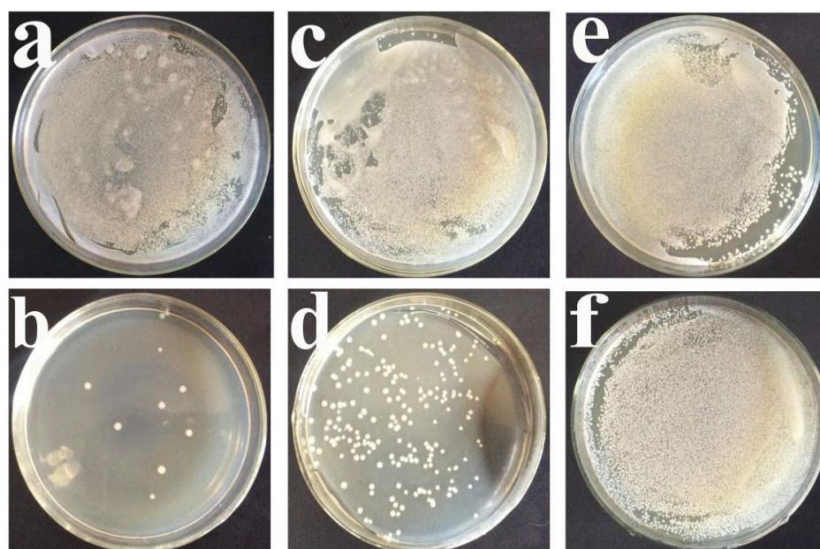


Figure S9. Detecting of $\cdot\text{O}_2^-$ in photocatalytic antibacterial tests of Ni/ZnO@void@SiO_2 with addition of (a, b) 0.01 mmol and (c, d) 0.05 mmol of tertiary butanol, respectively. (e, f) control tests only adding 0.05 mmol tertiary butanol without photocatalyst. (a, c, e) in dark condition. (b, d, f) under visible light irradiation for 20 min.