

Supporting Information

A Solution-Chemical Route to Generalized Synthesis of Metal Germanate Nanowires with Room-Temperature, Light-Driven Hydrogenation Activity of CO₂ into Renewable Hydrocarbon Fuels

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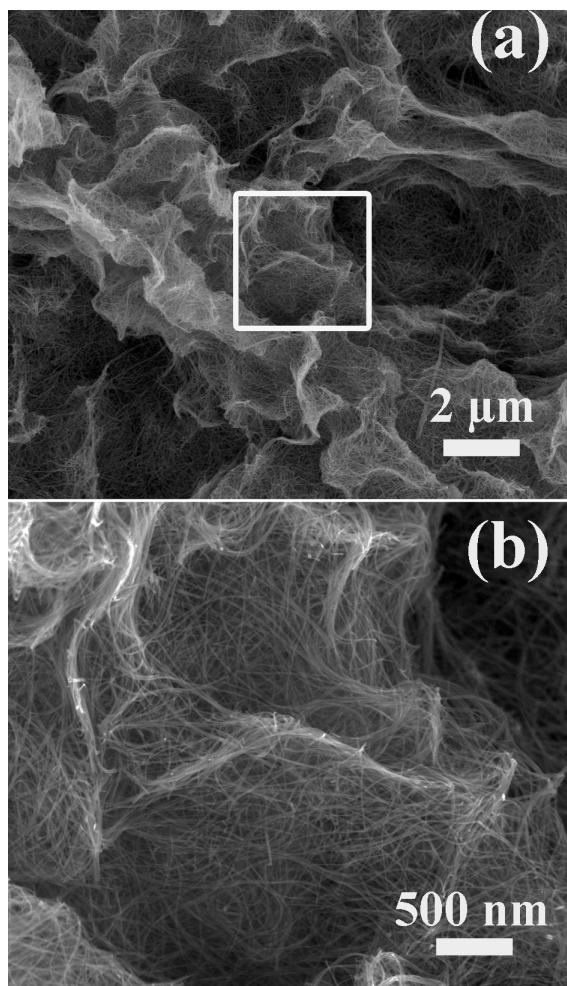


Figure S1. SEM images of the Cd₂Ge₂O₆ nanowire at different magnifications. (b)

Magnification of the selected area marked with a square as shown in (a).

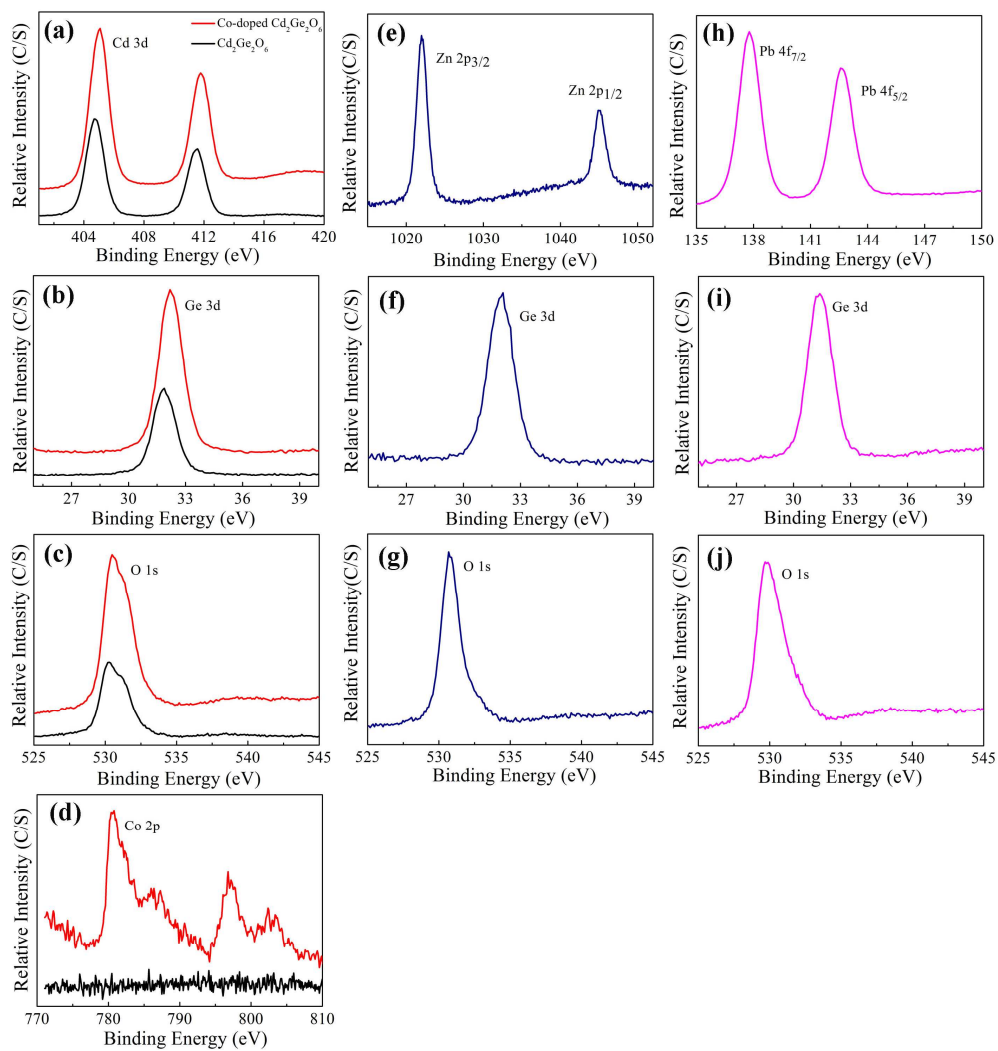


Figure S2. XPS spectra of (a-d) $\text{Cd}_2\text{Ge}_2\text{O}_6$ and Co-doped $\text{Cd}_2\text{Ge}_2\text{O}_6$ nanowires, (e-g) Zn_2GeO_4 nanowire, and (h-j) PbGeO_3 nanowire.

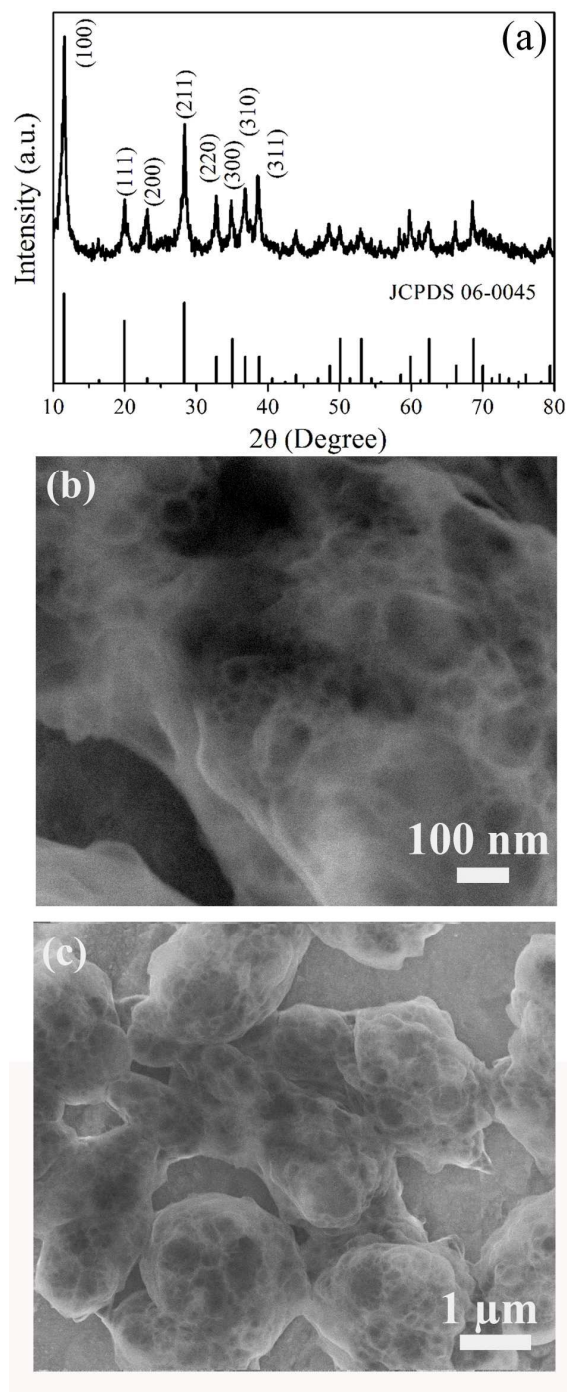


Figure S3. (a) XRD pattern, (b, c) corresponding FE-SEM image of the $\text{NH}_4\text{H}_3\text{Ge}_2\text{O}_6$ produced employing GeO_2 as a single reactant formed with volume ratio of $\text{N}_2\text{H}_4\cdot\text{H}_2\text{O} : \text{H}_2\text{O}$ of 1:2 for 12 h.

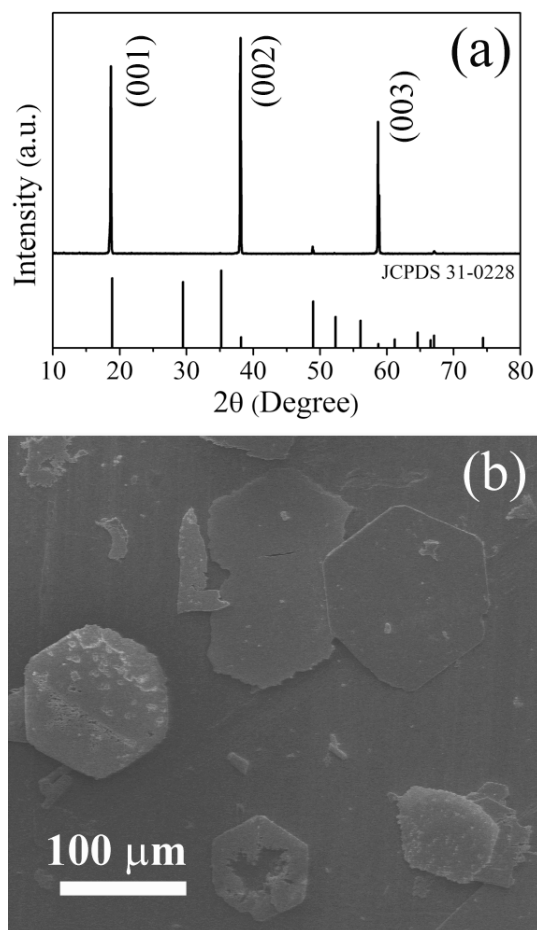


Figure S4. (a) XRD pattern and (b) FE-SEM image of the $\text{Cd}(\text{OH})_2$ hexagonal nanoplate formed with $\text{Cd}(\text{OAc})_2$ as single reactant with volume ratio of $\text{N}_2\text{H}_4\cdot\text{H}_2\text{O} : \text{H}_2\text{O}$ of 1:2.

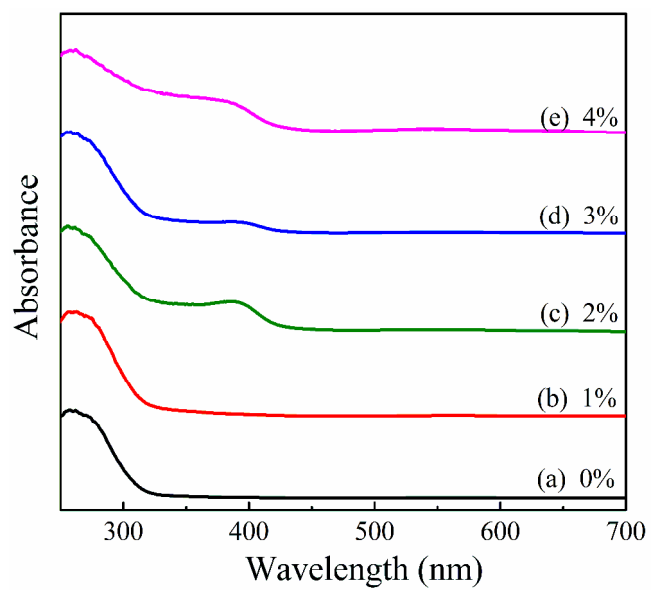


Figure S5. UV-vis absorption spectra of the $\text{Cd}_2\text{Ge}_2\text{O}_6$ and Co-doped $\text{Cd}_2\text{Ge}_2\text{O}_6$ nanowires with different cobalt percentages in the reaction precursors.

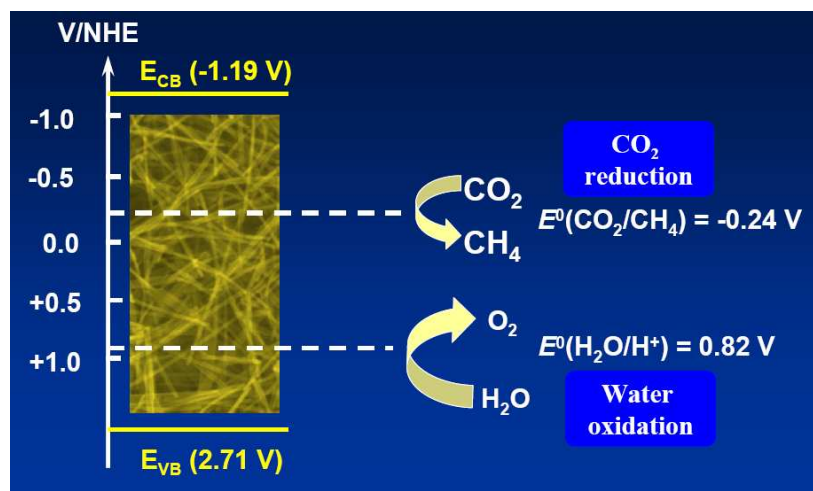


Figure S6. Relationship between the band structure of the $\text{Cd}_2\text{Ge}_2\text{O}_6$ nanowire and the redox potentials of CO_2 photoreduction

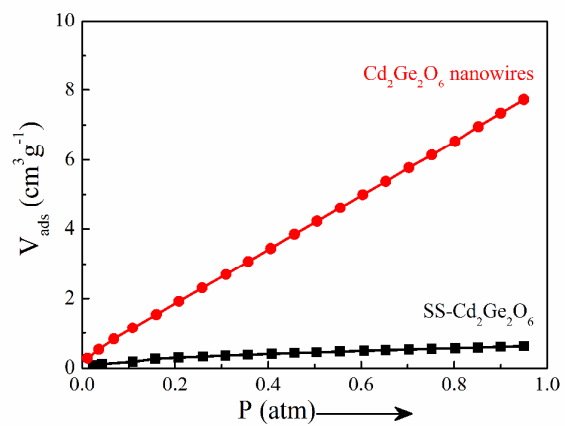


Figure S7. CO_2 adsorption isotherms (273 K) of the $\text{Cd}_2\text{Ge}_2\text{O}_6$ nanowire and SS- $\text{Cd}_2\text{Ge}_2\text{O}_6$.