

Supporting Information

Rationally Designed Nanoarray Catalysts for Boosted Photothermal CO₂ Hydrogenation

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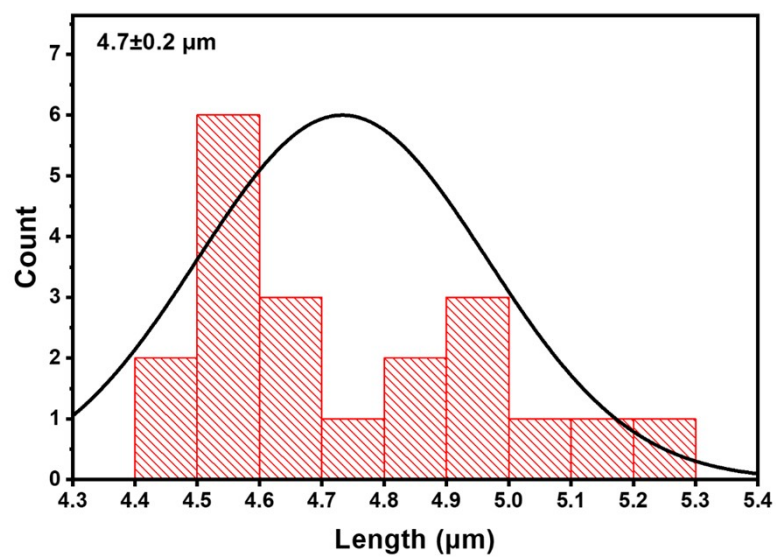


Fig. S1 Length distribution of the SiNCs.

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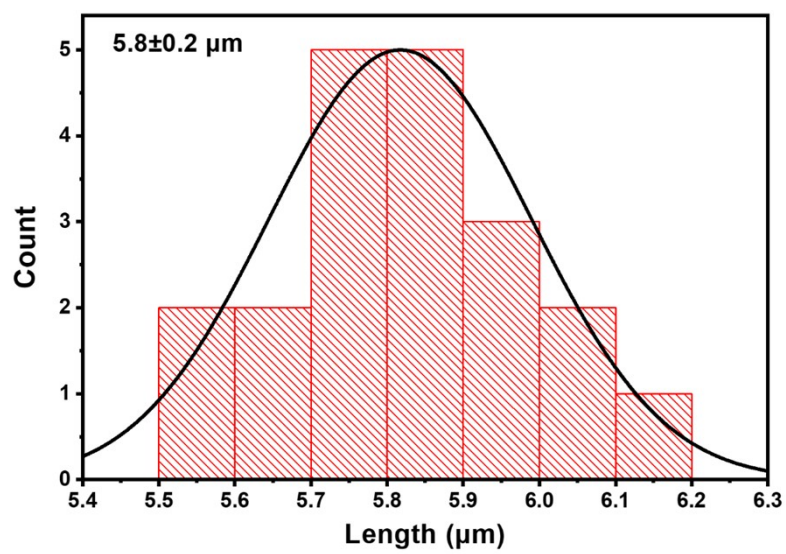


Fig. S2 Length distribution of the SiNWs.

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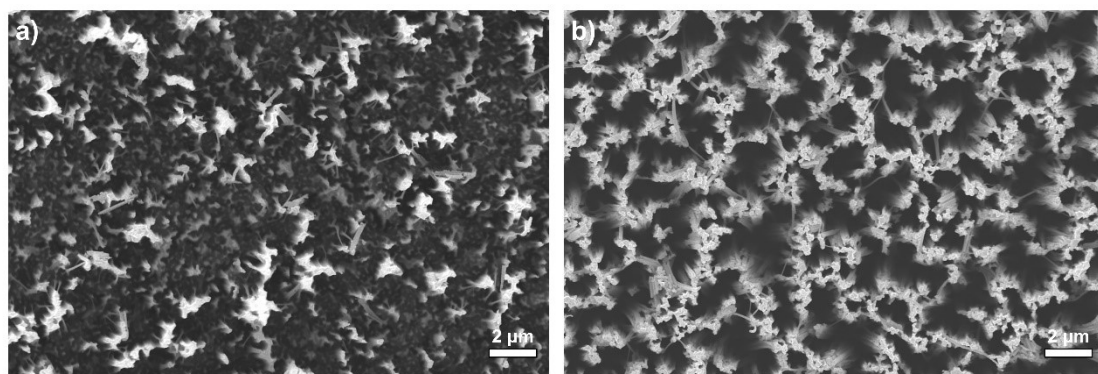


Fig. S3 Top-view SEM images of (a) SiNCs@Co-1 and (b) SiNWs@Co-1.

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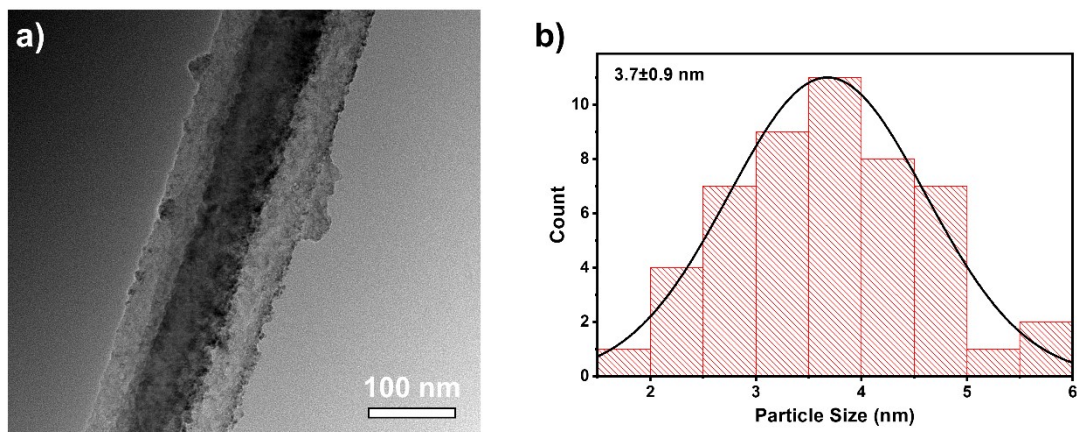


Fig. S4 (a) TEM image of the bottom region of a single nanocone from SiNCs@Co-1 and (b) corresponding distribution of cobalt particle size.

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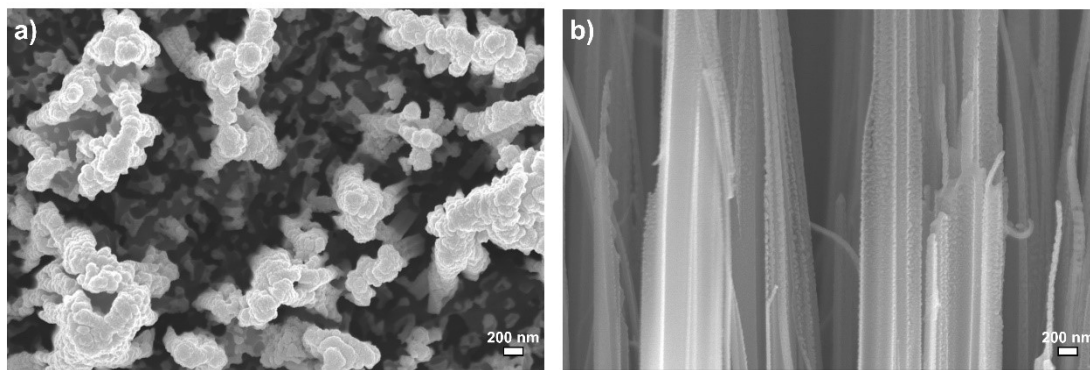


Fig. S5 (a) Top-view and (b) cross-sectional SEM image of the SiNCs@Co-2.

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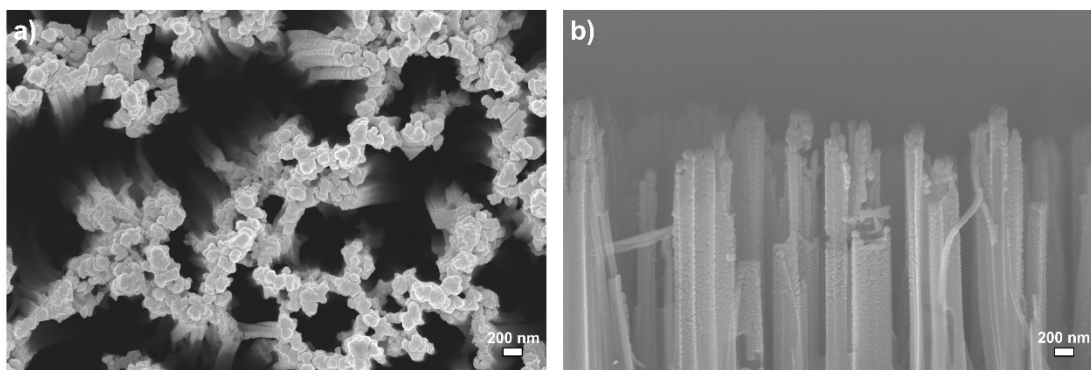


Fig. S6 (a) Top-view and (b) cross-sectional SEM image of the SiNWs@Co-2.

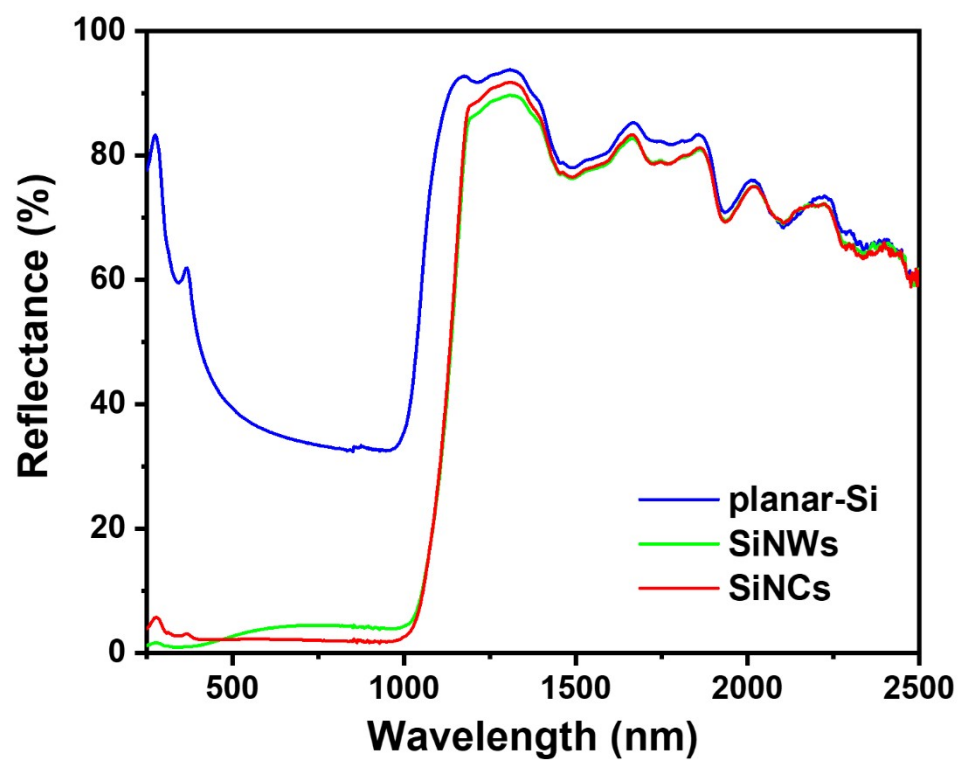


Fig. S7 Diffuse reflectance spectra of planar-Si, SiNWs and SiNCs.

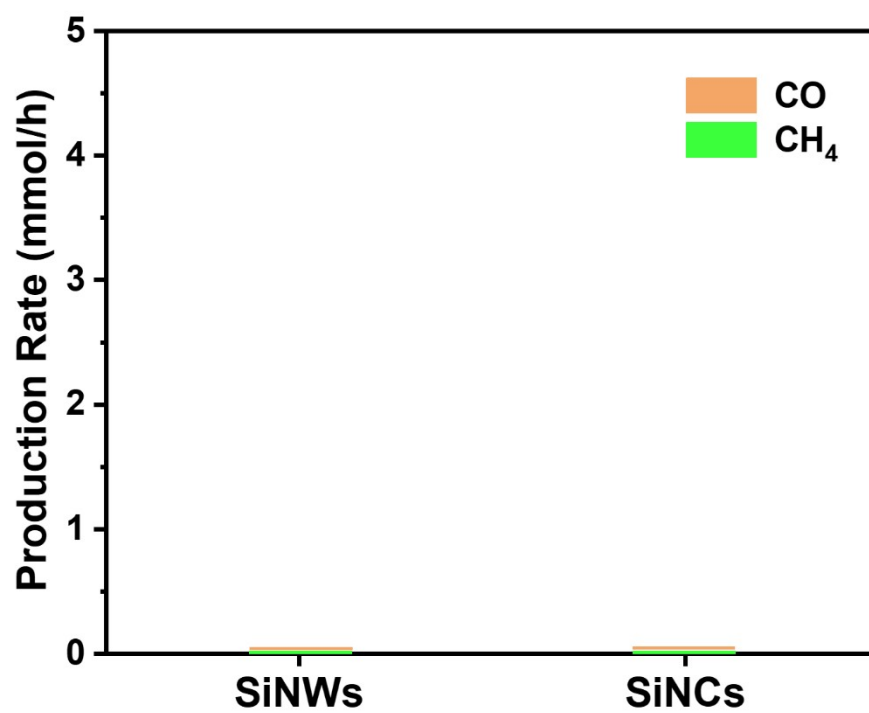


Fig. S8 Performance of SiNWs and SiNCs in photothermal CO₂ hydrogenation.

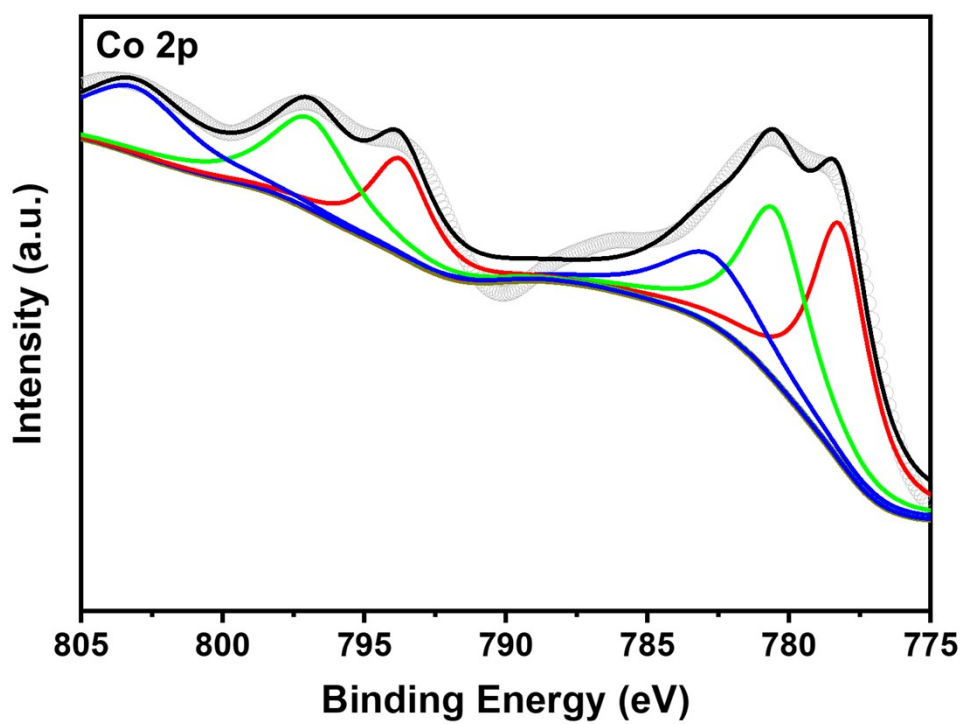


Fig. S9 X-ray photoelectron spectroscopy (XPS) spectra of SiNCs@Co in the Co(2p) regions.

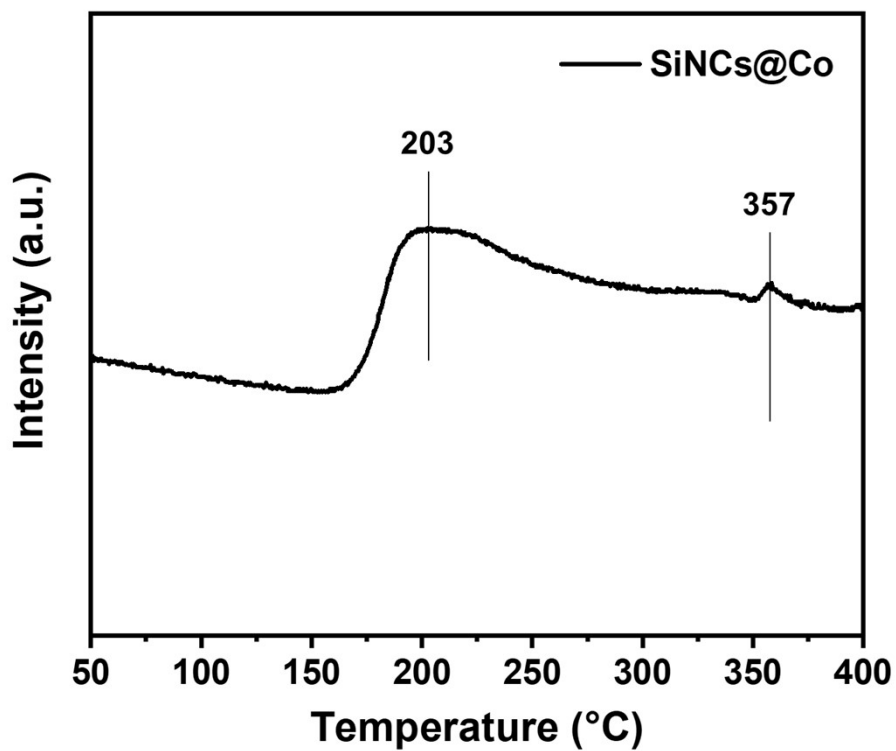


Fig. S10 Hydrogen temperature programmed reduction (H_2 -TPR) profile of SiNCs@Co.

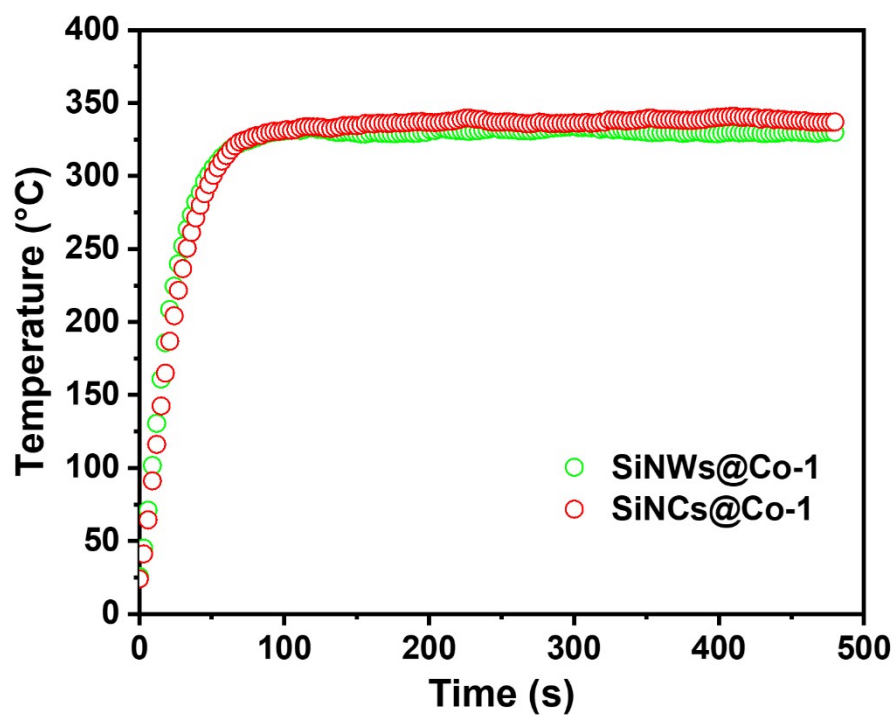


Fig. S11 Surface temperature profiles of SiNCs@Co-1 and SiNWs@Co-1 upon 25-sun irradiation.

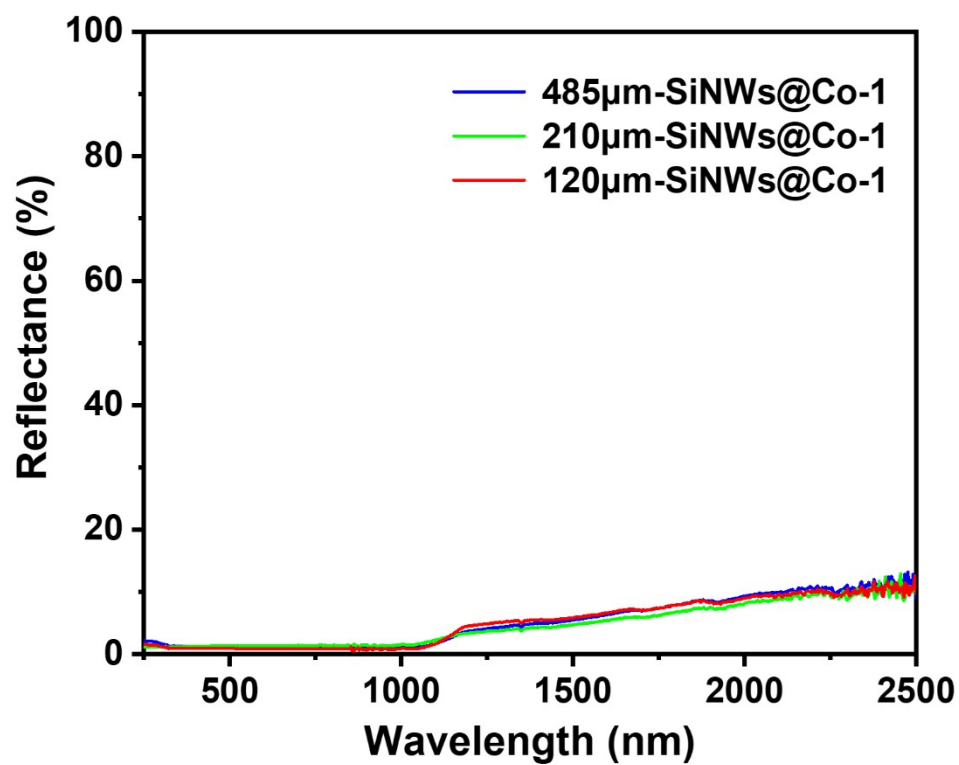


Fig. S12 Diffuse reflectance spectra of SiNWs@Co-1 with different substrate thicknesses.

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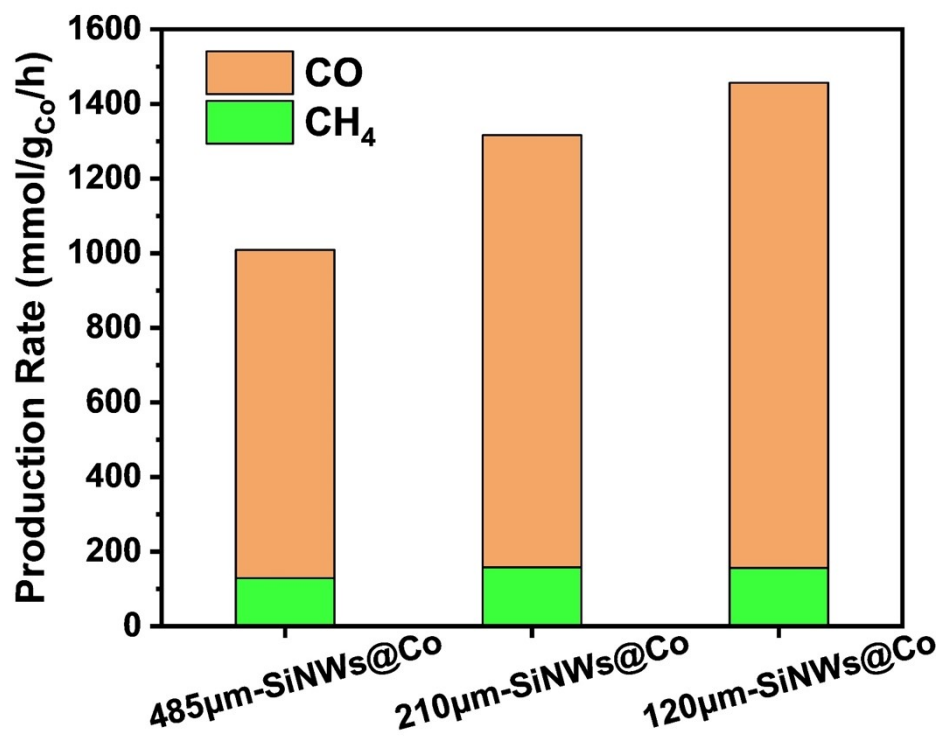


Fig. S13 Catalytic performance of SiNWs@Co-1 with different substrate thicknesses in photothermal CO₂ hydrogenation.

Supporting Information

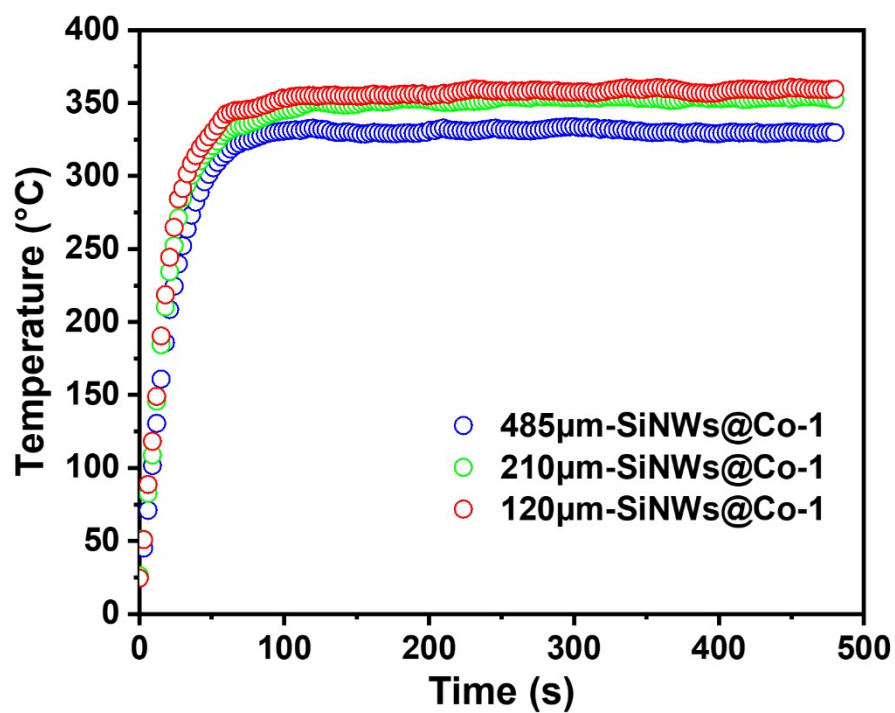


Fig. S14 Surface temperature profiles of SiNWs@Co-1 with different substrate thicknesses upon 25-sun irradiation.

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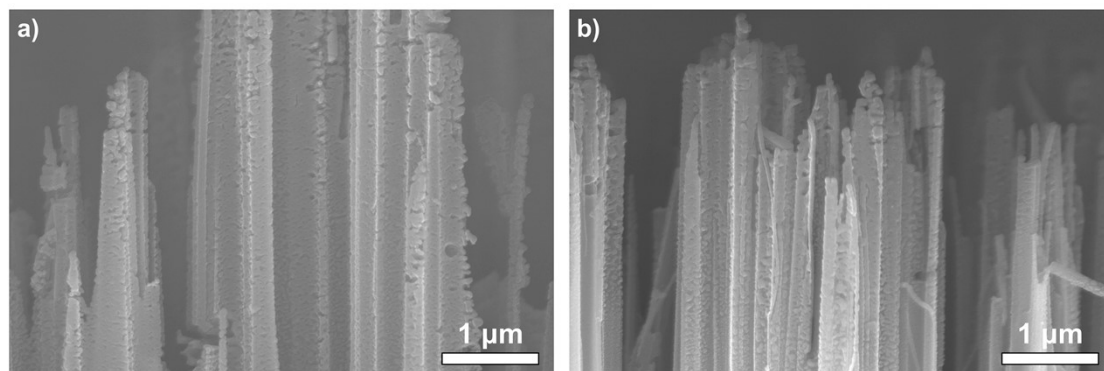


Fig. S15 SEM images of (a) SiNCs@Co-1 and (b) SiNWs@Co-1 after photothermal catalytic test.