Supplementary Information

Cobalt-promoted Zn encapsulation within Silicalite-1 for oxidative propane dehydrogenation with CO_2 by microwave catalysis at low temperature

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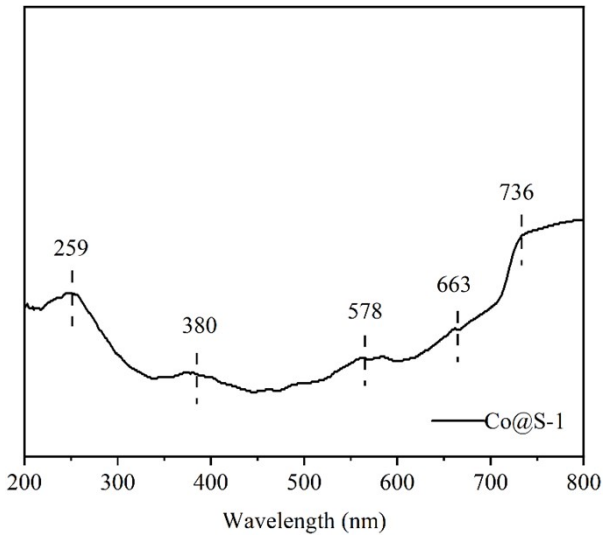

Figure S1. Raman spectrum of Co@S-1catalyst.

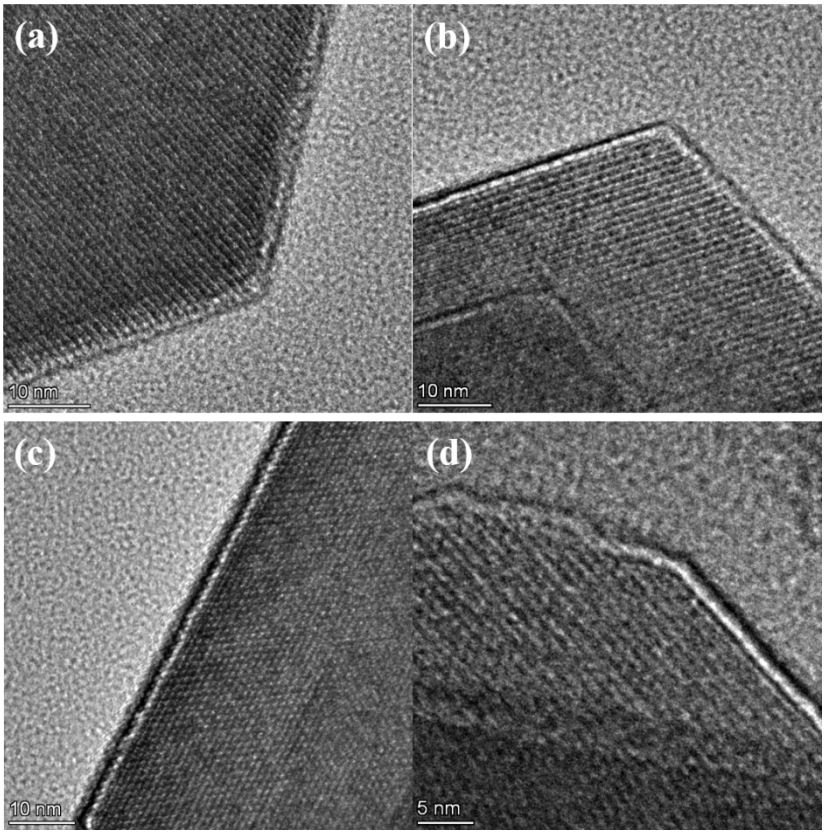

Figure S2. HRTEM images of Zn_8Co_1@S-1 catalyst.

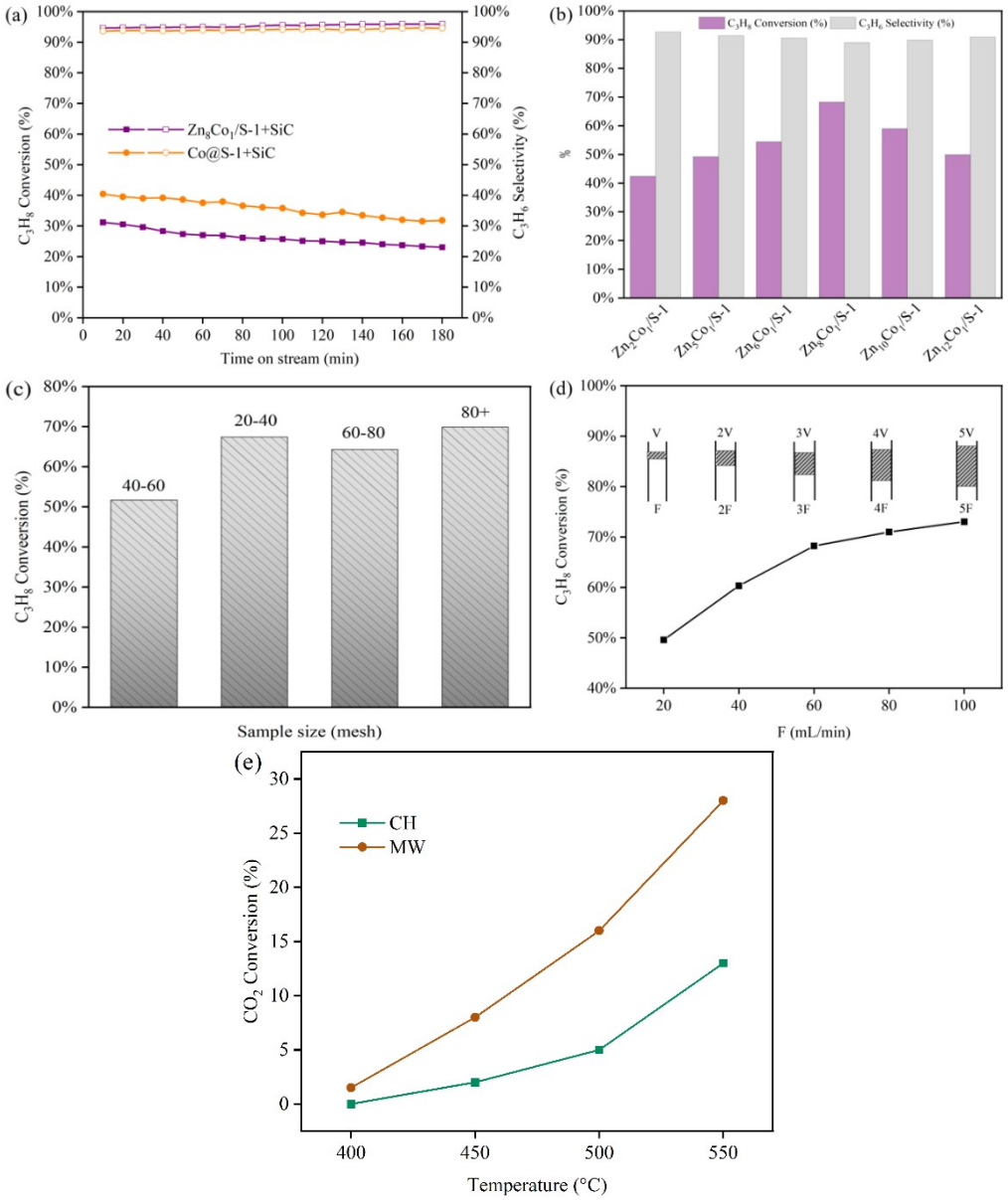

Figure S3. Performance of propane dehydrogenation under microwave. (a) Zn_8Co_1/S-1+SiC and Co@S-1+SiC microwave catalysts; (b) effect of different amounts of Zn and Co substances on catalytic activity; (c) effect of diffusion within the Zn_8Co_1/S-1+SiC microwave catalyst; (d) effect of diffusion outside the Zn_8Co_1/S-1+SiC microwave catalyst; (e) CO_2 conversion over Zn_8Co_1@S-1 catalysts at MW and CH, respectively **Reaction conditions:** 0.5 g catalyst+3 g SiC, 400-550 °C, 20-80+ mesh, 20~100 mL/min total flow of 10 vol% C_3H_8 and 20 vol% CO_2 in Ar for CO_2-ODHP, microwave power: 450-800W

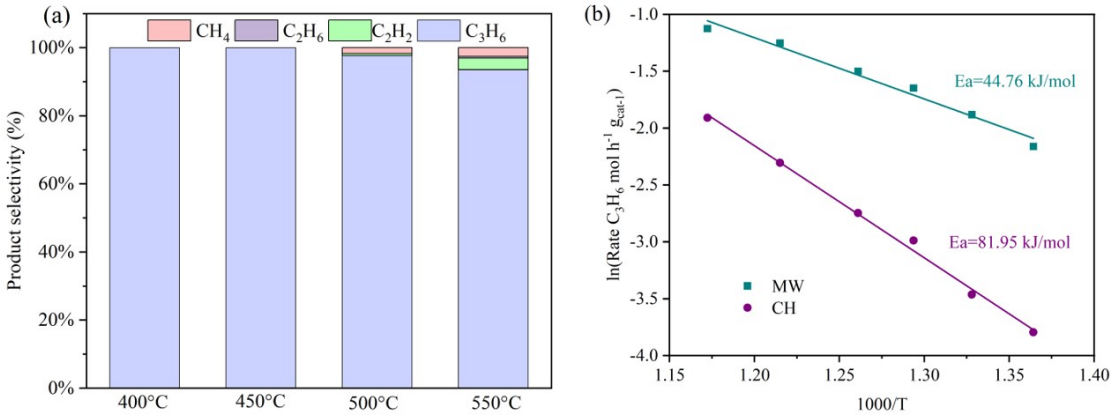

Figure S4. (a) Product distribution of Zn_8Co_1@S-1 catalyst at different temperatures under CH; (b) Linear fitting curves of CO_2-ODHP for catalysts under MW and CH. **Reaction conditions:** 0.5 g catalyst+3 g SiC, 400-580 °C, 40-60 mesh, 60 mL/min total flow of 10 vol% C_3H_8 and 20 vol% CO_2 in Ar for CO_2-ODHP, microwave power: 450-800W

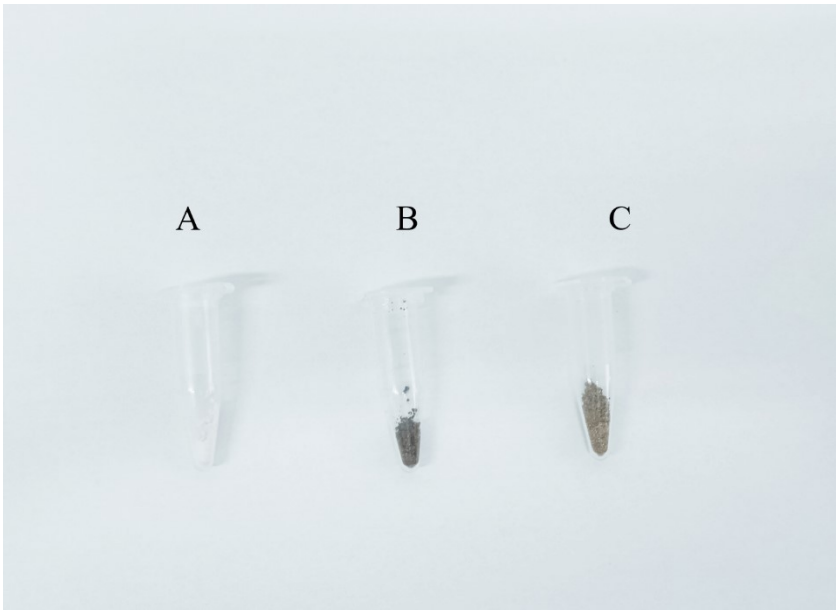

Figure S5. Photograph of Zn_8Co_1@S-1 catalyst. (a) Fresh catalyst; (b) Spent catalyst after PDH reaction; (c) Spent catalyst after CO_2-ODHP reaction.