Supporting Information

Comparative Study of Nickel-Silica Catalyst Architectures for CO_2 Methanation: Insights into Structure-Performance Relationships

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- **Transmission Electron Microscopy (TEM) of Calcined Catalysts**

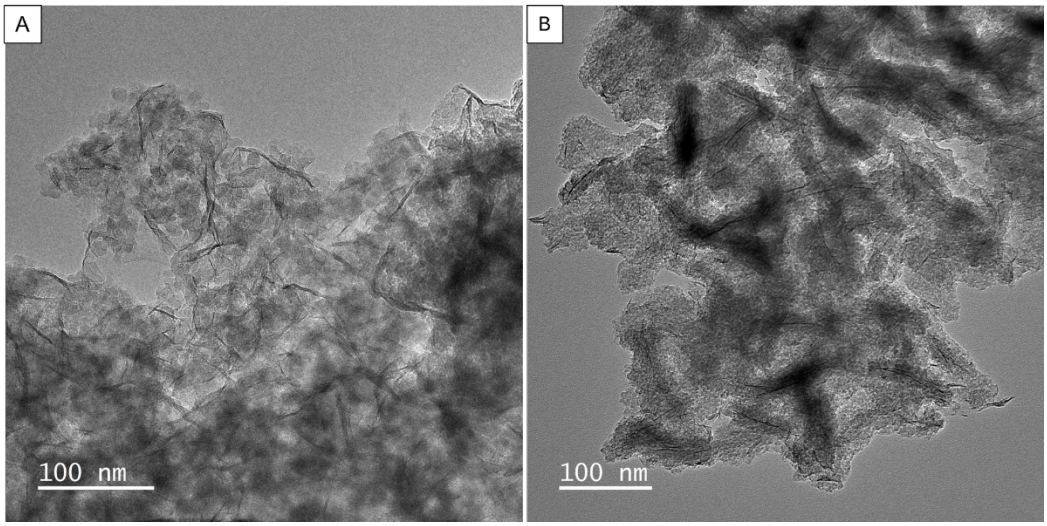

Figure S1. TEM images of the Ni@SiO_2 calcined catalysts: (A) SUP; (B) EMBD.

- **N_2 physisorption:**

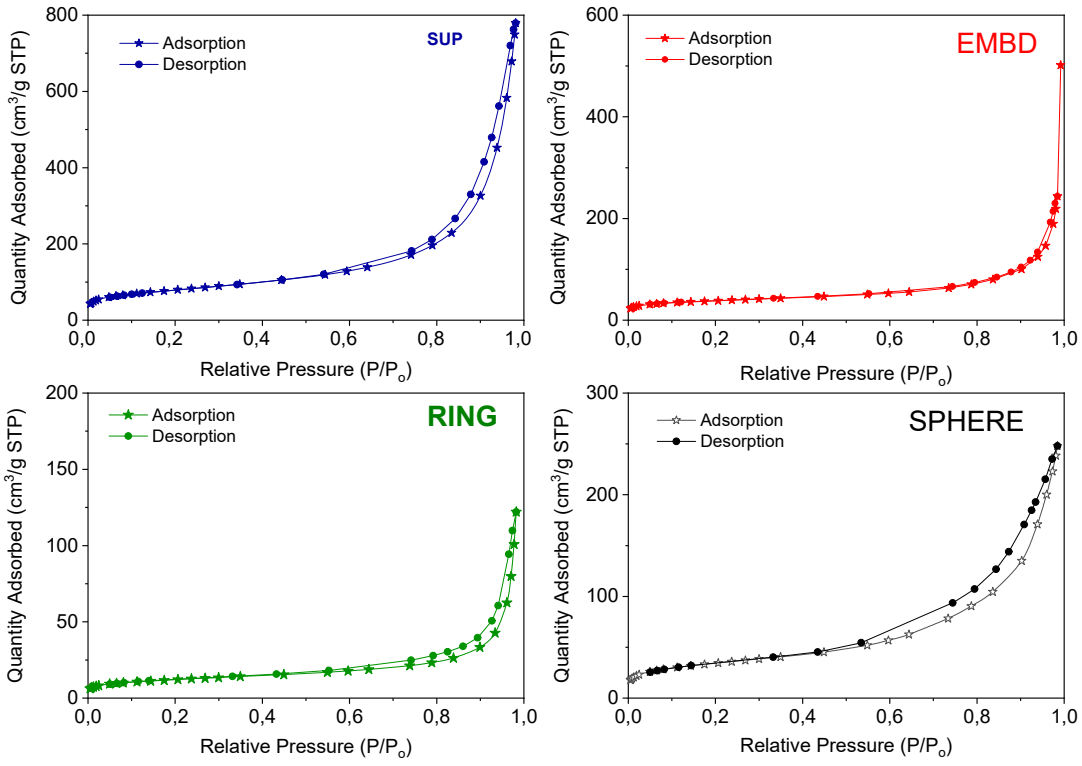

Figure S2. N_2 adsorption/desorption isotherms of the catalysts calcined

- **X-Ray Diffraction (XRD):**

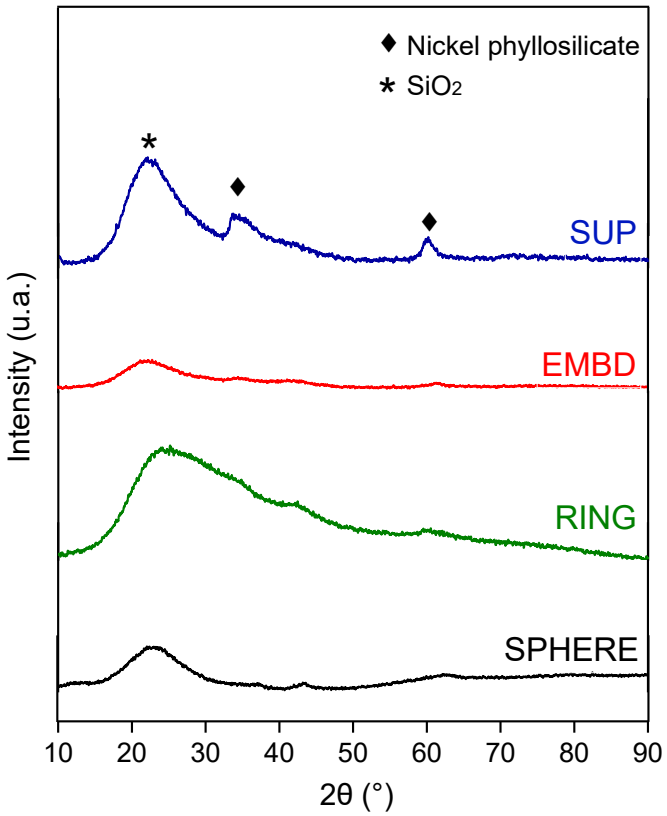

Figure S3. X-ray diffractograms of the catalysts: (A) SUP, (B) EMBD, (C) RING, (D) SPHERE.

- **Complete In Situ DRIFTS Analysis of All Catalysts under Reaction Conditions:**

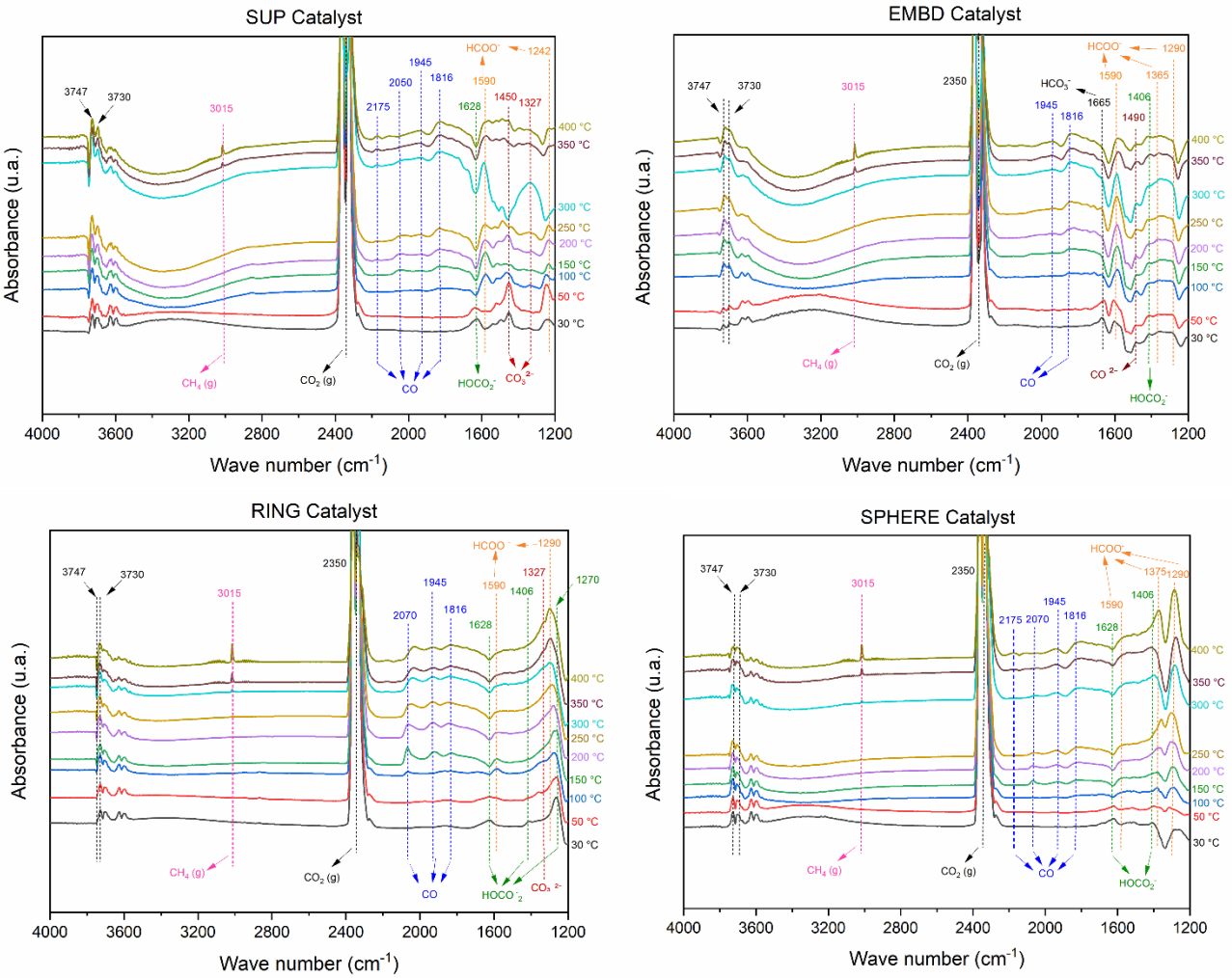

Figure S4. Complete In Situ DRIFTS Profiles of SUP, EMBD, RING, and SPHERE Catalysts under Reaction Conditions.

- **CH_4 formation rate as a function of different temperatures in the CO_2 methanation reaction for the catalysts.**

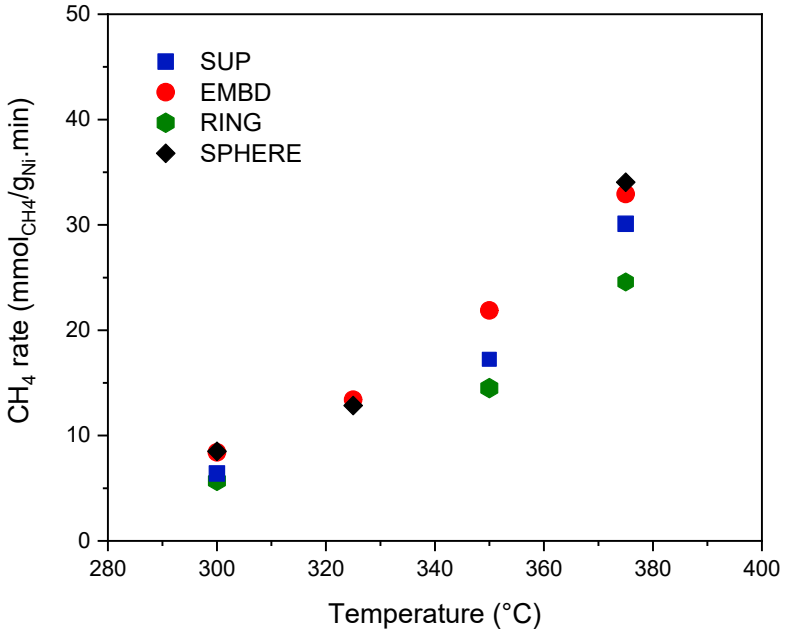

Figure S5. CH_4 formation rate as a function of different temperatures in the CO_2 methanation reaction for the catalysts.