

# Supporting Information

## Robust low-temperature microwave catalytic direct dehydrogenation of propane to propylene over Pt-Co/SiBeta+SiC

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Fig. S1 Catalyst preparation diagram.

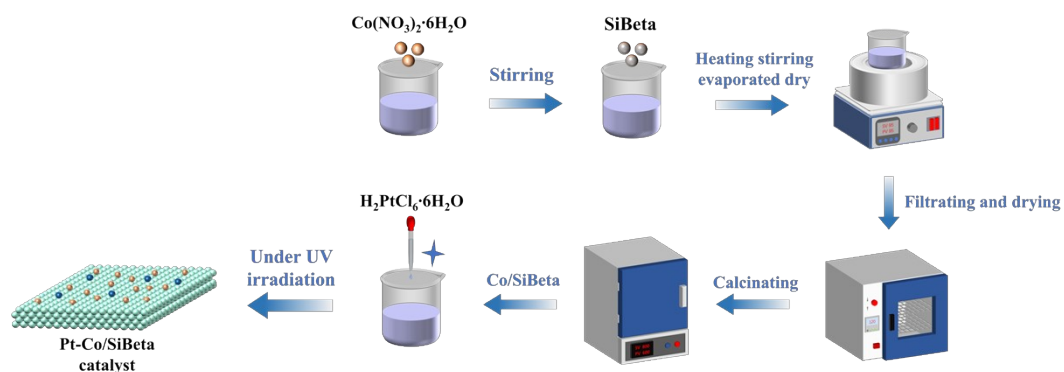


Fig. S1 Preparation diagram of Pt-Co/SiBeta catalyst.

Fig. S2 Device schematic diagram.

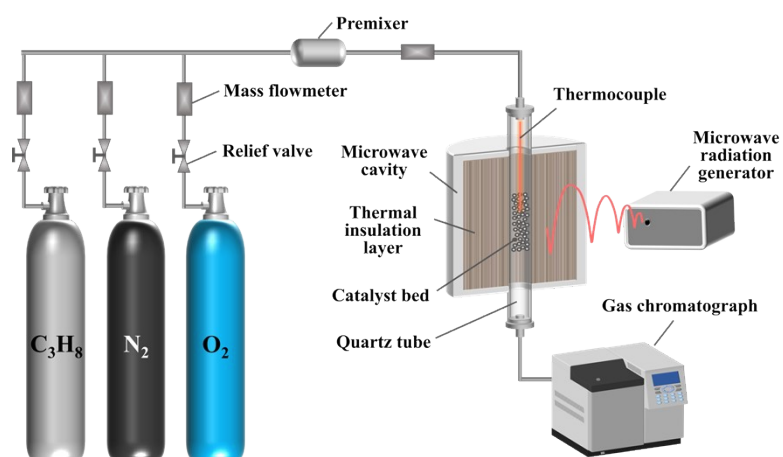


Fig. S2 Schematic diagram of the microwave catalytic reaction device.

**Table S1 Comparison table of C<sub>3</sub>H<sub>8</sub> conversion of different catalysts.**

Catalysts	Temperature/°C; Mode	Conversion C <sub>3</sub> H <sub>8</sub> /%	Selectivity C <sub>3</sub> H <sub>6</sub> /%	References
Pt-Co/SiBeta+SiC	450; Microwave Catalysis	50.4	97.2	This work
Pt-Co/SiO <sub>2</sub>	550; Thermal Catalysis	25	96	18
Co-Sn/NC	450; Microwave Catalysis	15	75	31
Pt-Ga@Al <sub>2</sub> O <sub>3</sub>	450; Thermal Catalysis	3.6	91	55
Pt-Sn/Al <sub>2</sub> O <sub>3</sub>	500; Thermal Catalysis	12	99	56
Pt-Zn-DeAlBEA	500; Thermal Catalysis	32	99	57
CoAl <sub>2</sub> O <sub>4</sub>	550; Thermal Catalysis	8	80	58
PtY@ZnS-1	550; Thermal Catalysis	21.4	98	59
CoB/SiBEA	575; Thermal Catalysis	46.6	99	60
PtZn-2Ce/MZ	580; Thermal Catalysis	39	98	61
Pt/Ge-MFI	585; Thermal Catalysis	42	98	62
Co/Pt@A	590; Thermal Catalysis	32.3	88.8	63
Co-Al <sub>2</sub> O <sub>3</sub> -HT	590; Thermal Catalysis	21.2	94.6	64
PtSn/KAl <sub>2</sub> O <sub>3</sub> -Sn(acac) <sub>2</sub>	600; Thermal Catalysis	50.9	99.5	65
Co@S-1(EDA)	600; Thermal Catalysis	30	92	66
H-Co@S-1	600; Thermal Catalysis	41.3	96.3	67

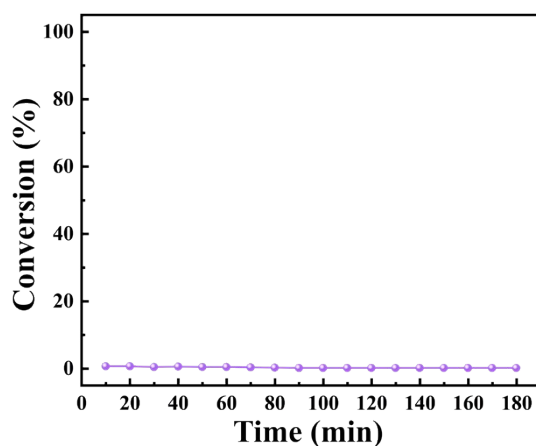
**Fig. S3 The catalytic performance of SiC under MCRM.****Fig. S3 C<sub>3</sub>H<sub>8</sub> conversion of SiC under MCRM.**

Fig. S4 Linear fitting curve.

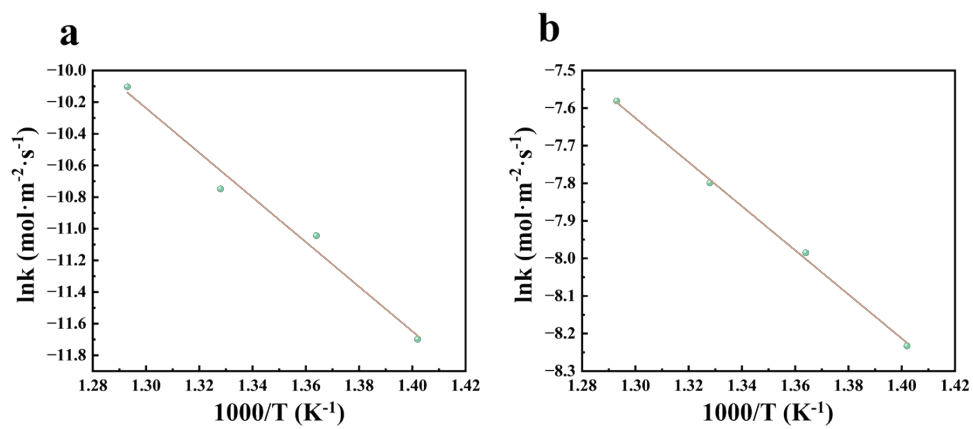


Fig. S4 The linear fitting curves of the PDH reaction of the catalyst under different reaction modes: (a) CRM; (b) MCRM.