

Fig. S1. XRD pattern of Zn/Z-5

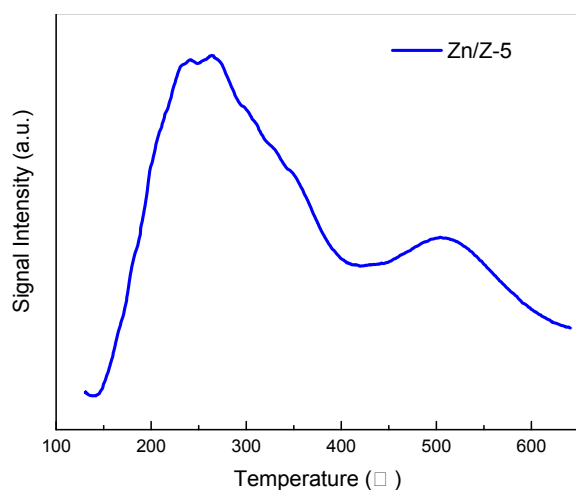


Fig. S2. NH<sub>3</sub>-TPD pattern of Zn/Z-5

Table. S1 Metal content, surface area, and pore volumes of Zn/Z-5 catalyst

Sample	Zn content/wt%(AAS)	S <sub>BET</sub> (m <sup>2</sup> g <sup>-1</sup> )	S <sub>micro</sub> (m <sup>2</sup> g <sup>-1</sup> )	V <sub>total</sub> (cm <sup>3</sup> g <sup>-1</sup> )	V <sub>micro</sub> (cm <sup>3</sup> g <sup>-1</sup> )
Zn/Z-5	1.31	342	254	0.34	0.13

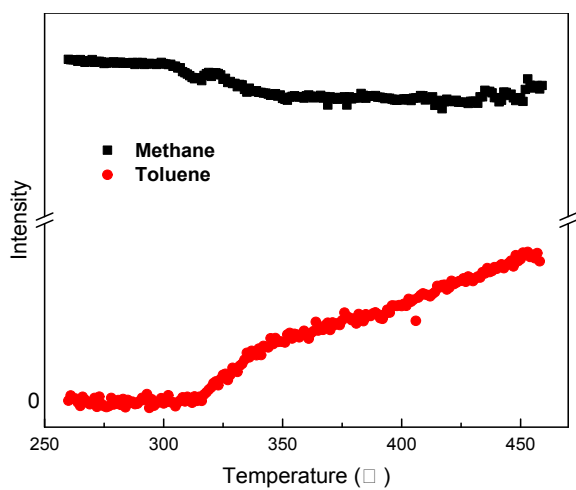


Fig. S3. TPSR-MS profiles of co-feeding CH<sub>4</sub> with CH<sub>3</sub>OH over Zn/Z-5 (methane and toluene)