

Supporting Information

Selective methanation of CO over HZSM-5 supported Ni and Ni-Ru catalysts

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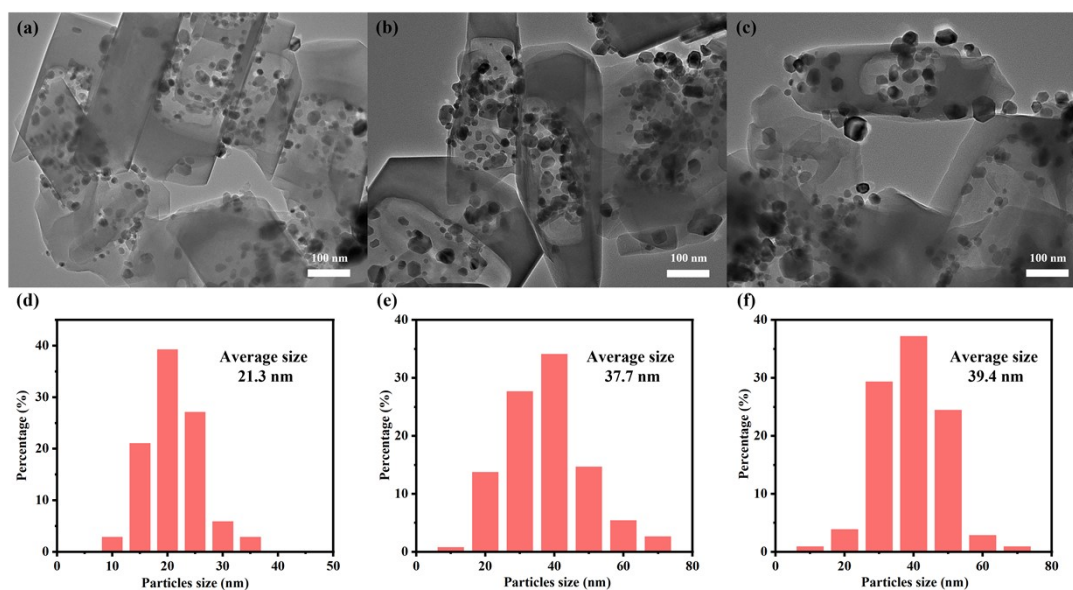


Figure S1 TEM images (a, b, c) and Ni particle size distributions (d, e, f) of 15Ni/HZSM-5(38) (a, d), 20Ni/HZSM-5(38) (b, e), and 25Ni/HZSM-5(38) (c, f). The counted number of Ni particles was over 100.

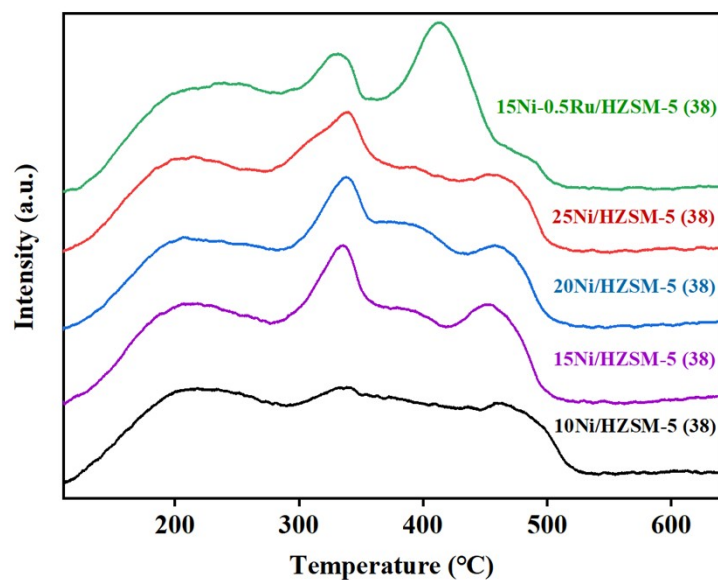


Figure S2 NH₃-TPD profiles of xNi/HZSM-5(38) and 15Ni-0.5Ru/HZSM-5(38) after reduction.

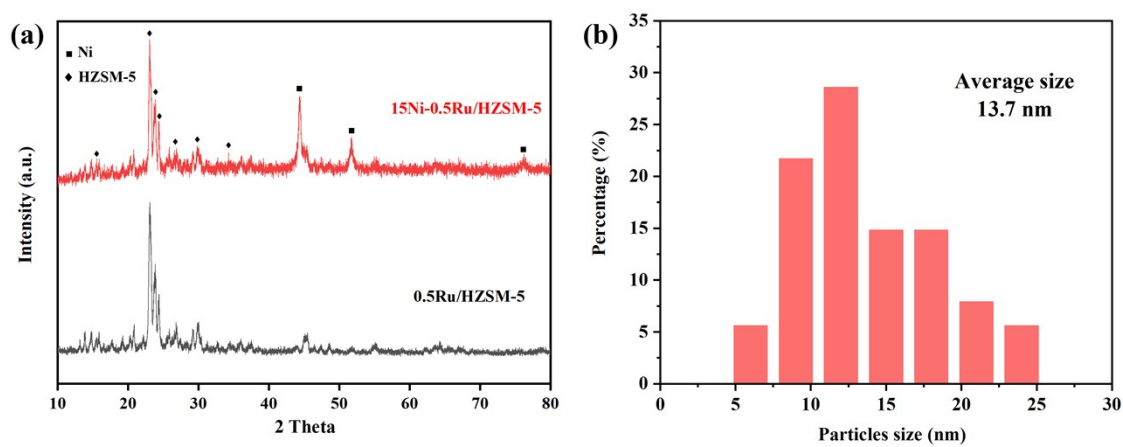


Figure S3 XRD profiles of 0.5Ru/HZSM-5(38), 15Ni-0.5Ru/HZSM-5(38) (a); Ni particle size distribution of 15Ni-0.5Ru/HZSM-5(38) according to TEM images (b). The counted number of Ni particles was over 100.

Table S1 Contents of different NiO compositions on 10Ni/HZSM-5(x) catalysts after calcination.

Sample	Contents (%)		
	free NiO	highly dispersed NiO	bulk NiO
10Ni/HZSM-5(38)	2.8	84.1	13.1
10Ni/HZSM-5(70)	6.5	78.9	14.6
10Ni/HZSM-5(170)	4.5	80.9	14.6

Table S2 Optimum performance of Ni/HZSM-5 catalysts in CO-SMET process.

Sample	Temperature (°C)	Residual CO (ppm)	S _{CO} (%)
10Ni/HZSM-5(38)	250	209	99
10Ni/HZSM-5(70)	280	598	94
10Ni/HZSM-5(170)	300	3528	84
15Ni/HZSM-5(38)	230	67	98
20Ni/HZSM-5(38)	240	92	95
25Ni/HZSM-5(38)	270	132	91