Selective Hydrodeoxygenation of Fatty Acids to Dodecane: The Role of Molybdenum

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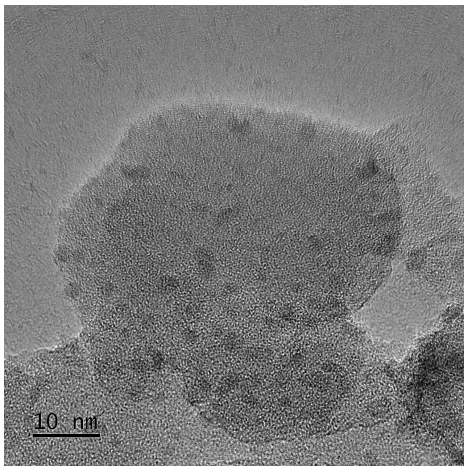

Figure S1TEM image of Mo/SiO_2.

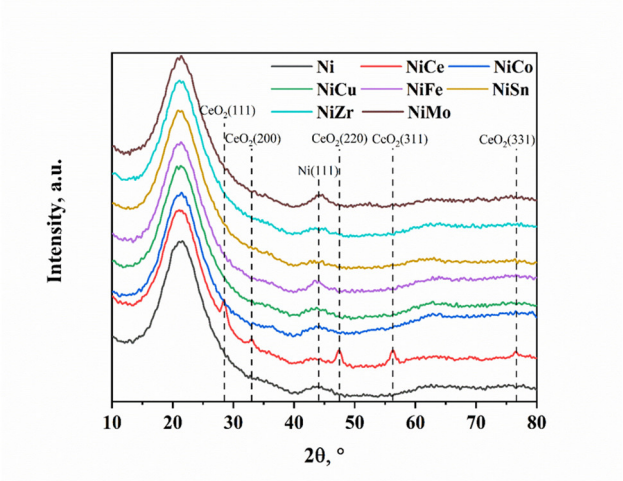

Figure S2 XRD patterns of Ni_5M_1/SiO_2

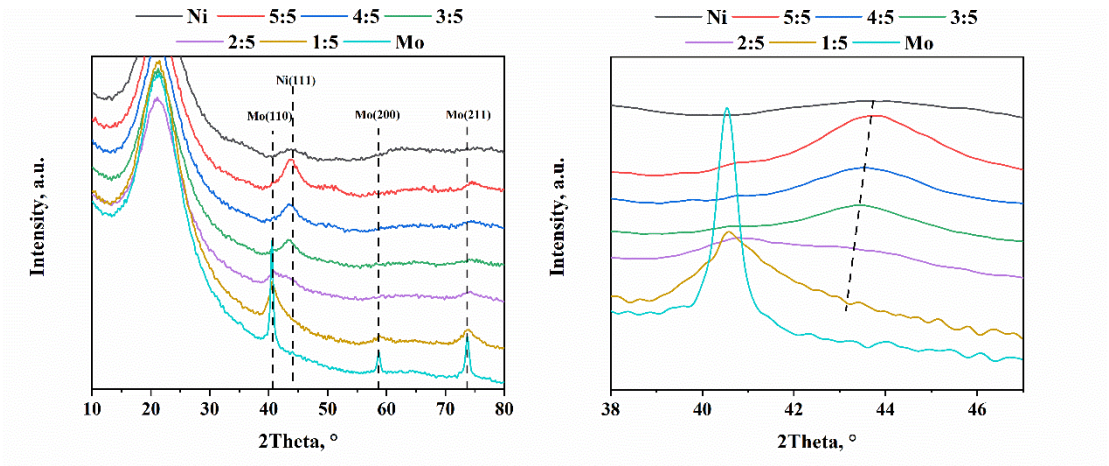

Figure S3 XRD patterns of Ni/SiO_2, Mo/SiO_2 and Ni_xMo_5/SiO_2

Table S1 Accurate metal loading and Ni dispersity of Ni/SiO_2, Mo/SiO_2, and Ni_5Mo_x/SiO_2.

	Metal loading, wt% [a]		Dispersity, % [b]
	Ni	Mo	
Ni	10.55	-	35.40
Ni_5Mo_1	9.88	1.45	36.05
Ni_5Mo_3	10.65	5.2	17.89
Ni_5Mo_5	10.47	8.7	17.85
Ni_5Mo_7	9.28	10.24	10.25
Ni_5Mo_{10}	9.66	16.23	9.80
Mo		10.12	0.19

[a], Metal loading amount was determined by ICP-OES.

[b], Dispersity of Ni was calculated based on the N_2O-titration results.

Table S2 Chemical state of Ni by XPS [a], %

Catalysts	Ni^0	Ni^{2+}
Ni	9.55	90.45
Ni_5Mo_1	19.44	80.56
Ni_5Mo_3	16.61	83.39
Ni_5Mo_5	17.53	82.47
Ni_5Mo_7	12.57	87.43

[a], calculated by the peak area of XPS

Table S3 Chemical state of Mo by XPS [a], %

Catalysts	Mo^0	Mo^{3+}	Mo^{4+}	Mo^{5+}	Mo^{6+}
Ni_5Mo_1	0.00	16.81	17.92	24.85	40.42
Ni_5Mo_3	4.72	10.57	27.62	17.42	39.67
Ni_5Mo_5	5.52	16.32	25.49	19.89	32.79
Ni_5Mo_7	8.15	16.15	25.10	25.58	25.02
Mo	7.54	19.91	28.21	25.72	18.62

[a], calculated by the peak area of XPS

Table S4 Effect of Mo content on the conversion of lauric acid and product selectivity

	Conversion of lauric acid, %	Product selectivity, %			
		Lauryl alcohol	Undecane	Dodecane	Lauryl laurate
Ni	9.73	28.48	7.92	2.14	65.30
Ni_5Mo_1	94.27	47.60	30.92	7.94	11.43
Ni_5Mo_3	98.36	57.71	20.10	10.76	10.17
Ni_5Mo_5	92.47	64.55	11.94	9.08	13.17
Ni_5Mo_7	81.68	65.47	7.11	6.63	18.45
Ni_5Mo_{10}	53.67	56.65	12.71	5.35	27.46
Ni_5Mo_3 mix	52.57	49.29	14.06	3.15	31.41