Deoxygenation of Stearic Acids using Alkaline Treated Beta Molecular Sieves Assisted by Microwave Irradiation

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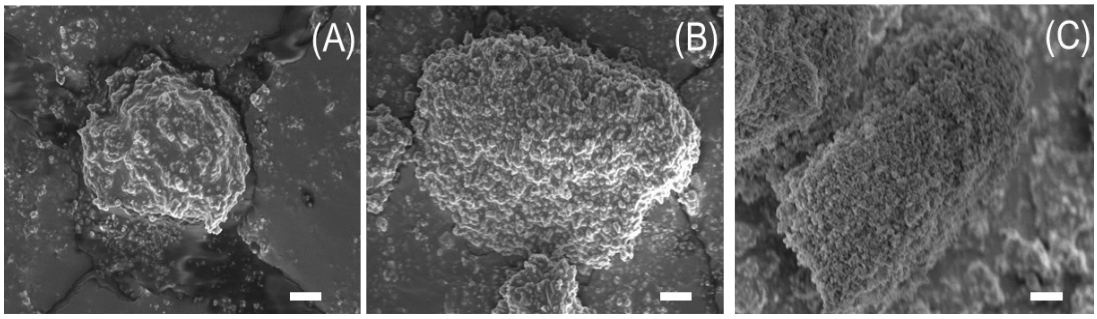


Figure S1 SEM images of Beta-1 (A), Beta-2 (B), and Beta-3 (C). Scale bar represents 1 μm.

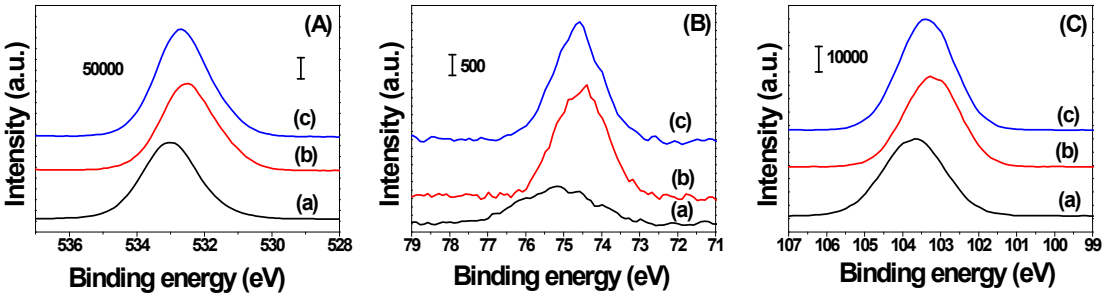


Figure S2 O_{1s} (A), Al_{2p} (B), and Si_{2p} (C) XPS spectra of Beta-1 (a), Beta-2 (b), and Beta-3 (c)

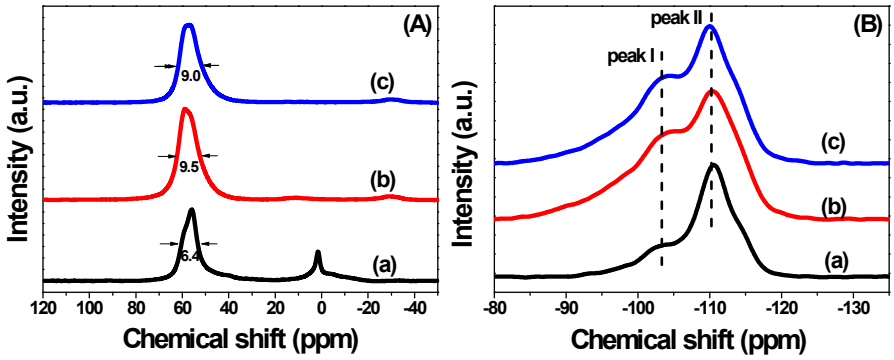
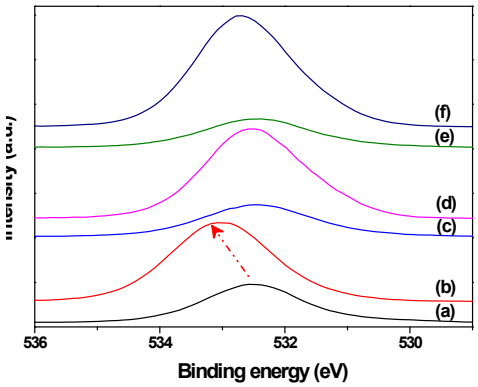


Figure S3 ^{27}Al and ^{29}Si MAS NMR spectra of Beta-1 (a), Beta-2 (b), and Beta-3 (c)



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107 **Figure S4 XPS spectra of the O 1s core level for Beta-1 (a), Ni/Beta-1 (b), Beta-2 (c), Ni/Beta-**

108 **2 (d), Beta-3 (e), and Ni/Beta-3 (f) samples recorded at room temperature. Notes: Spectra of**

109 **(a), (c), and (e) are cited from Figure S2 (C). Spectra (a, c, and e) and (b, d, and f) were**

110 **detected in two tests. Therefore, the intensity of spectra is different and spectra are**

111 **employed to compare the binding energy.**

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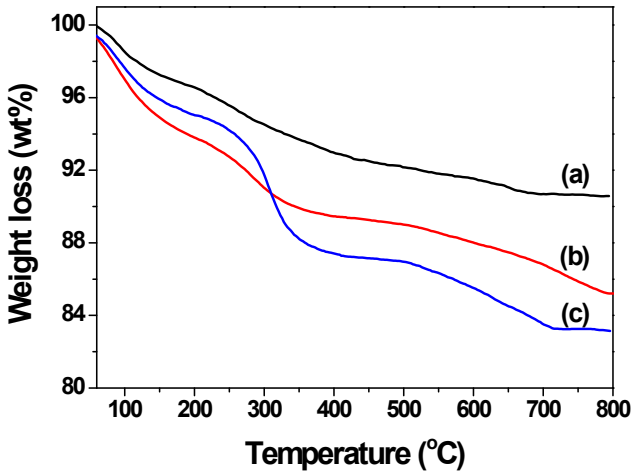

Figure S5 TG curves of spent Ni/Beta-1 (a), Ni/Beta-2 (b), and Ni/Beta-3 (c) catalysts.

137 Table S1 The composition of gas products

	methane(wt%)	ethane(wt%)	ethylene(wt%)	propane(wt%)
Ni/Beta-1	62%	12%	22%	4%
Ni/Beta-2	33%	12%	22%	33%
Ni/Beta-3	32%	13%	21%	34%

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157 Table S2 Catalytic performance of catalysts in references

	Catalyst	Reaction conditions	Conversion (%)	C_{15-18} selectivity (%)	Iso-paraffin selectivity (%)	Ref.
1	5% Pt/γ-Al_2O_3	T=375 °C, P=2 MPa, t=5 h	100	97	<1	1
2	4% Pd/C	T=300 °C, P=1.7MPa, t=5h	100	98	<1	2
3	10% Ni/γ-Al_2O_3	T=330 °C, P=5MPa,	100	88	<1	3
4	7% Ni/SiO_2		49	67	2	4
5	7% Ni/γ-Al_2O_3		91	88	<1	4
6	7% Ni/SAPO-11	T=220 °C, P=2MPa, t=6 h	99	93	3	4
7	7% Ni/H-ZSM-5		99	53	11	4
8	7% Ni/H-Y		99	30	13	4
9	Ni/Al_2O_3	T=360 °C, P=2 MPa, t=0.75h	100	58	1	5
10	4% Pd/C	T=375 °C, P=1.5MPa, t=5 h	90	43	<1	6

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