

Supporting Information:

Redox oxidative cracking of *n*-Hexane with Fe-substituted barium hexaaluminates as redox catalysts

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This document provides additional reaction data.

Table S1. Supplemental reaction data for thermal blank and BaFe₆Al₆O₁₉ (BaFe6) with different amounts of Na₂WO₄ promotion at $T = 700$ °C and GHSV = 9000 h⁻¹. Accompanying **Figure 4a** of **Results and Discussion**.

Selectivity (%) Sample	Ethylene (C ₂ H ₄)	Propylene (C ₃ H ₆)	Butenes (C ₄ H ₈)	1,3-Butadiene (C ₄ H ₆)	Pentenenes (C ₅ H ₁₀)	Methane (CH ₄)	C ₂ -C ₄ paraffins	CO _x	H ₂ conversion
Blank	35.4	26.03	17.27	0.94	5.52	10.51	4.28	--	100.00
BaFe6	14.74	2.43	0.78	2.04	0.18	3.93	1.86	70.84	100.00
5-NaW/BaFe6	20.50	9.96	5.90	4.42	1.88	3.27	1.44	52.01	100.00
10-NaW/BaFe6	31.22	20.34	14.25	3.44	5.11	5.92	3.01	16.04	100.00
20-NaW/BaFe6	33.58	25.22	16.87	2.21	5.79	7.78	4.19	3.71	100.00

Table S2. Supplemental reaction data for 20-NaW/BaFe6 at $T = 700\text{ }^{\circ}\text{C}$ and different GHSV ($2250\text{ h}^{-1} - 9000\text{ h}^{-1}$). Accompanying **Figure 7** of **Results and Discussion**.

Selectivity (%) GHSV (h^{-1})	Ethylene (C_2H_4)	Propylene (C_3H_6)	Butenes (C_4H_8)	1,3-Butadiene (C_4H_6)	Pentenenes (C_5H_{10})	Methane (CH_4)	$\text{C}_2\text{-C}_4$ paraffins	CO_x	H_2 conversion
2250	35.48	25.35	14.64	2.85	4.04	9.70	4.52	1.89	81.14
4500	34.25	25.23	15.93	2.22	5.03	9.26	4.40	1.75	88.53
9000	33.58	25.22	16.87	2.21	5.79	7.78	4.19	3.71	100.00