Supplementary Information for *Catalytic Hydrodeoxygenation of Black Soldier Fly Larval Lipids and Co-processing with Vacuum Gas Oil into Biofuel Intermediates*

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Supplementary Tables

Table S1: Oil yields (excluding olefin contribution) from batch lipid HDO experiments

Run	Yield [wt%]	Run	Yield [wt%]
B1	38.94	B9	70.38
B2	66.56	B10	65.25
B3	62.94	B11	67.97
B4	65.25	B12	68.94
B5	60.98	B7r1	71.62
B6	71.27	B7r2	69.73
B7	71.17	B7r3	71.63
B8	72.19	B10r1	65.90
Average	66.30		

r1–r3 denote replicate runs.

Table S2: Hydrocarbon-type composition of liquid products from batch lipid HDO experiments

Sample	Paraffin [wt%]	Isoparaffin [wt%]	Olefin [wt%]	Naphthene [wt%]	Aromatic [wt%]
B1	46.32	4.06	22.30	0.08	0.05
B2	78.37	8.24	3.76	4.04	0.77
B3	76.47	6.30	9.71	3.31	0.71
B4	79.49	8.20	2.17	4.64	1.84
B5	77.04	7.15	11.29	0.59	0.60
B6	89.02	6.38	0.17	1.41	0.00
B7	88.19	9.47	0.04	0.82	0.00
B8	89.55	7.22	0.00	1.75	0.00
B9	88.12	7.87	0.00	1.99	0.00
B10	80.65	6.81	4.36	4.55	0.81
B11	85.72	7.43	0.05	2.91	0.00
B12	87.62	6.60	0.07	2.06	0.02
B7r1	88.19	8.16	0.07	1.67	0.00
B7r2	87.10	7.68	0.00	1.86	0.00
B7r3	87.57	9.56	0.11	0.63	0.01
B10r1	75.13	11.98	3.23	5.02	2.81

r1–r3 denote replicate runs.

Table S3: Elemental nitrogen and sulfur contents in batch lipid HDO and co-processing experiments

Sample	N [wt%]	S [wt%]
Untreated lipids	n.d.	n.d.
B1	n.d.	n.d.
B2	0.96	0.06
B3	n.d.	n.d.
B4	0.00	0.48
B5	0.04	1.32
B6	0.03	0.10
B7	0.01	0.11
B8	0.00	0.21
B9	0.08	0.31
B10	0.01	1.25
B11	0.15	0.32
B12	0.04	0.25
Untreated VGO	0.06	0.85
X1	0.30	0.50
X2	0.10	0.80
X3	0.01	0.64
X4	0.04	0.45

n.d. = not determined.

Table S4: Yield distribution of samples from batch lipid HDO experiments based on fuel-range boiling-point cuts: gasoline 50–180 °C, jet fuel 180–250 °C, diesel 250–350 °C, heavy fuel 350 °C–FBP

Range [°C]	B1 [wt%]	B2 [wt%]	B3 [wt%]	B4 [wt%]	B5 [wt%]	B6 [wt%]	B7 [wt%]	B8 [wt%]	B9 [wt%]	B10 [wt%]	B11 [wt%]	B12 [wt%]
50–180	1.26	4.08	2.18	5.24	1.92	1.23	1.41	0.95	1.24	3.91	1.53	1.34
180–250	24.36	27.85	29.41	27.51	27.95	33.04	37.33	37.84	36.97	32.01	36.35	35.58
250–350	30.80	20.60	22.39	19.71	23.70	24.72	27.97	28.97	28.05	26.30	28.06	27.46
350–FBP	20.63	20.28	18.39	16.85	17.72	14.50	5.42	5.38	5.49	8.07	4.71	7.10

Table S5: Gas-phase composition [mol%] from the batch lipid HDO experiments

Sample	CH4 [mol%]	i-butane [mol%]	n-butane [mol%]	ethane [mol%]	propene [mol%]	n-pentane [mol%]	CO2 [mol%]	propane [mol%]	CO [mol%]
B1_1	9.73	0.03	0.07	1.33	1.67	0.00	53.60	10.78	5.76
B1_2	9.90	0.04	0.07	1.37	1.72	0.00	52.52	11.18	5.86
B1_3	10.04	0.04	0.07	1.41	1.76	0.00	52.73	11.47	5.94
B2_1	8.32	0.03	0.22	2.69	0.62	0.07	60.50	6.57	4.36
B2_2	8.65	0.03	0.24	2.86	0.66	0.07	60.32	7.06	4.55
B2_3	8.72	0.03	0.25	2.91	0.67	0.07	60.14	7.18	4.58
B3_1	8.66	0.03	0.11	0.97	0.37	0.03	68.61	9.27	1.12
B3_2	8.86	0.04	0.11	1.01	0.38	0.03	69.04	9.67	1.15
B3_3	8.87	0.03	0.12	1.02	0.38	0.03	67.01	9.82	1.15
B4_1	14.07	0.00	0.36	2.85	0.35	0.10	56.85	7.90	1.28
B4_2	14.22	0.00	0.36	2.91	0.36	0.10	56.27	8.07	1.30
B4_3	14.24	0.00	0.37	2.93	0.36	0.10	56.20	8.20	1.30
B5_1	14.75	0.04	0.10	0.77	0.32	0.02	61.74	9.37	0.48
B5_2	14.95	0.04	0.10	0.79	0.33	0.02	61.20	9.65	0.49
B5_3	15.26	0.04	0.11	0.81	0.33	0.03	65.31	9.91	0.49
B6_1	5.57	0.05	0.07	0.89	0.04	0.00	41.13	8.14	2.90
B6_2	5.51	0.05	0.07	0.89	0.04	0.00	37.80	8.16	2.88
B6_3	5.51	0.05	0.07	0.89	0.04	0.00	37.62	8.17	2.88
B7_1	8.25	0.04	0.06	0.32	0.00	0.00	34.72	5.79	2.38
B7_2	8.23	0.04	0.06	0.32	0.00	0.00	34.38	5.80	2.38
B7_3	8.23	0.04	0.06	0.32	0.00	0.00	34.17	5.76	2.38
B8_1	5.82	0.05	0.05	0.15	0.00	0.00	35.22	5.30	2.04
B8_2	5.78	0.05	0.05	0.15	0.00	0.00	33.00	5.33	2.03
B8_3	5.78	0.05	0.05	0.15	0.00	0.00	32.89	5.33	2.03
B9_1	10.62	0.04	0.05	0.49	0.00	0.00	38.07	6.69	1.48
B9_2	10.71	0.04	0.05	0.49	0.00	0.00	40.38	6.68	1.49
B9_3	10.60	0.04	0.05	0.49	0.00	0.00	37.25	6.71	1.48
B10_1	15.69	0.04	0.17	1.20	0.17	0.04	63.04	8.30	0.62
B10_2	15.63	0.04	0.17	1.20	0.17	0.04	61.00	8.34	0.62
B10_3	15.71	0.04	0.17	1.20	0.16	0.04	63.87	8.33	0.62
B11_1	15.16	0.04	0.07	0.45	0.00	0.00	36.13	6.34	1.00
B11_2	15.15	0.04	0.07	0.45	0.00	0.00	35.85	6.34	1.00
B11_3	15.34	0.04	0.07	0.46	0.00	0.00	39.63	6.34	1.01
B12_1	11.70	0.03	0.04	0.46	0.00	0.00	32.29	4.95	1.78
B12_2	11.68	0.03	0.04	0.46	0.00	0.00	31.78	4.95	1.77
B12_3	11.69	0.03	0.04	0.46	0.00	0.00	31.72	4.97	1.77

Each row is one technical injection from the same gas sample; three injections per experiment.