

Renewable Diesel Blendstocks and Bioprivileged Chemicals

Distilled from Algal Biocrude Oil Converted via

Hydrothermal Liquefaction

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Supplementary Tables

Table S1. Chemical and elemental compositions of Spirulina used in this study

Compositions (d.w.%) ^a	Spirulina
S	0.73
P	1.06
K	1.71
Mg	0.47
Ca	0.18
Na	1.25
Fe	0.02
Mn (ppm)	75
Cu (ppm)	6
Zn (ppm)	29

^aReported by dry weight basis

Table S2. Properties of the biocrude converted from Spirulina (dry weight basis)

Property	SP-Biocrude
HHV (MJ/kg)	26.4
C (wt.%)	58.3±0.2
H (wt.%)	8.12±0.3
N (wt.%)	6.00±0.2
O ^a (wt.%)	27.6

^aCalculated by difference

Table S3. Normalized GC-MS signals of major components identified in the distillates from SP-derived biocrude; “×” indicates the chemical was not detected.

Compound Name	Distillation Fractions						
	120	185	219	225	230	232	256
Hydrocarbons							
Decane	×	0.06	0.17	0.06	0.12	0.18	0.11
Decene	×	0.02	0.07	0.01	0.04	0.10	0.15
Methyldecane	×	×	×	×	0.02	0.02	0.01
Undecane	0.03	0.08	0.20	0.08	0.18	0.24	0.13
Undecene	×	0.01	0.14	0.01	0.09	0.13	0.18
Demethylundecane	×	0.03	0.05	0.04	0.03	0.03	0.03
Dodecane	0.02	0.09	0.26	0.12	0.24	0.30	0.15
Dodecene	0.05	0.09	0.28	0.23	0.44	0.49	0.47
Trimethyl dodecane	×	0.02	0.06	0.05	0.06	0.02	0.02
Tridecane	0.03	0.15	0.36	0.25	0.40	0.39	0.20
Tridecene	0.01	×	0.12	0.05	0.15	0.20	0.18
Methyltridecane	×	×	0.03	0.02	0.02	0.03	0.02
Tetradecane	×	0.21	0.41	0.50	0.64	0.53	0.25
Tetradecene	×	0.03	0.07	0.09	0.10	0.10	0.06
Pentadecane	0.07	0.44	0.75	1.47	1.36	0.86	0.34
Pentadecene	×	0.05	0.09	0.18	0.26	0.23	0.17
Tetramethylpentadecane	×	0.01	0.03	0.13	0.15	0.07	×
Hexadecane	0.04	0.08	0.14	0.39	0.56	0.45	0.17
Hexadecene	0.01	×	0.03	0.16	0.29	0.34	0.18
Tetramethylhexadecane	0.01	0.03	0.15	0.71	0.96	0.67	0.14
Tetramethylhexadecene	0.21	0.11	0.17	0.24	0.07	0.03	×
Heptadecane	0.52	0.59	0.93	1.58	1.10	0.59	0.21
Tetramethylheptadecane	×	×	×	×	0.09	0.07	0.05
Octadecane	×	×	×	0.06	0.17	0.23	0.04
Cycloalkanes							
Cumene	0.04	0.05	×	0.03	0.02	×	×
Ionene	0.14	0.48	0.19	0.07	0.06	0.03	0.01
Dimethylnaphthalene	×	×	0.04	0.04	0.03	0.02	0.02
Phenols							
Phenol	×	0.50	×	0.02	×	×	0.02
Methyl phenol	×	0.31	0.26	0.03	0.08	×	0.01
Dimethylphenol	×	×	0.13	×	0.08	0.03	0.03
Oxygenates							
Diethylene glycol dibenzoate	0.08	0.11	0.09	0.11	0.13	0.13	0.13
Hexadecacenol	×	×	×	0.07	0.10	0.02	×
N-Heterocyclic Compounds							
Methyl indole	×	×	×	0.27	0.07	0.06	×
Indolizine, 2-methyl-6-ethyl-	×	×	×	×	0.09	0.08	×
Pyrazine, 3-ethyl-2,5-dimethyl-	0.13	×	×	×	×	×	×
Pyrazine, ethyl-methyl	0.14	×	×	×	×	×	×
1H-Pyrrole, 3-ethyl-2,4-dimethyl-	0.03	0.02	×	×	×	×	×
1-Butyl-1H-Pyrrole	0.06	0.05	×	0.01	×	×	×
Fatty Nitriles							
Hexadecanenitrile	×	×	×	×	0.86	1.21	2.60
Heptadecanenitrile	×	×	×	×	0.04	0.04	0.13

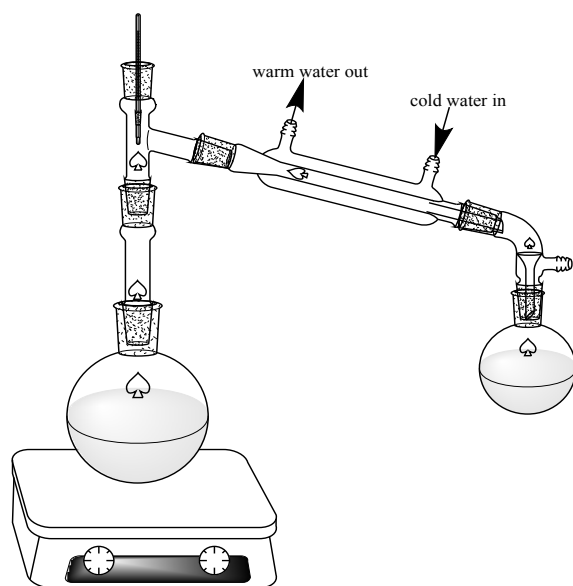


Figure S1. The distillation set-up for separating biocrude oil