

Detailed Group-Type Characterization of Plastic-Waste Pyrolysis Oils: By Comprehensive Two-Dimensional Gas Chromatography Including Linear, Branched, and Di-Olefins

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Table S1. Composition (wt%) of the diesel fraction in terms of all detected pure hydrocarbons and oxygenates by group types and carbon number (P = n-paraffins, I = iso-paraffins, O = α -olefins, IO = iso-olefins, DO = diolefins, MN = mononaphthenes + unsaturated mononaphthenes), DN = dinaphthenes, MA = monoaromatics, NA = naphthenoaromatics, Ot = oxygen-containing compounds).

#C	P	IP	O	IO	DO	MN	DN	MA	NA	Ot
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00
8	0.02	0.00	0.02	0.00	0.00	0.02	0.00	0.01	0.00	0.01
9	0.14	0.19	0.16	0.08	0.01	0.09	0.01	0.05	0.00	0.00
10	1.45	0.08	2.22	0.19	0.06	0.84	0.17	0.06	0.02	0.00
11	2.65	0.20	4.42	0.65	0.23	1.62	0.16	0.04	0.03	0.00
12	2.89	0.26	4.20	0.91	0.34	1.73	0.14	0.08	0.05	0.00
13	3.00	0.24	4.24	0.88	0.49	1.66	0.35	0.07	0.04	0.00
14	3.03	0.39	4.47	0.87	0.58	1.73	0.23	0.06	0.05	0.00
15	3.05	0.40	4.06	0.95	0.41	1.30	0.24	0.06	0.06	0.00
16	2.92	0.58	3.37	0.93	0.52	1.86	0.23	0.06	0.05	0.00
17	2.76	0.59	2.93	0.95	0.45	1.25	0.24	0.07	0.08	0.00
18	2.59	0.46	2.74	0.83	0.52	1.28	0.13	0.08	0.07	0.00
19	2.37	0.38	2.40	0.79	0.30	0.82	0.20	0.04	0.06	0.00
20	1.19	0.22	0.91	0.66	0.27	0.36	0.18	0.03	0.04	0.00
21	0.24	0.08	0.23	0.05	0.03	0.05	0.02	0.00	0.00	0.00
22	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	28.36	4.05	36.39	8.77	4.21	14.62	2.30	0.72	0.53	0.03

Table S2. Composition (wt%) of plastic waste pyrolysis oil derived naphtha fraction in terms of all detected pure hydrocarbons and oxygenates by group types and carbon number (P = n-paraffins, I = iso-paraffins, O = α -olefins, IO = iso-olefins, DO = diolefins, MN = mononaphthenes + unsaturated mononaphthenes), DN = dinaphthenes, MA = monoaromatics, NA = naphthenoaromatics, Ot = oxygen-containing compounds).

#C	P	IP	O	IO	DO	MN	DN	MA	NA	Ot
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.34	0.02	0.53	0.34	0.00	0.40	0.00	0.00	0.00	0.00
6	2.03	0.14	5.28	0.63	0.00	3.03	0.00	0.64	0.00	0.00
7	3.99	0.40	7.87	0.52	0.98	5.85	2.76	2.17	0.00	0.02
8	3.83	0.67	8.70	1.84	0.95	5.91	1.58	3.70	0.00	0.04
9	3.61	0.31	8.07	3.98	1.52	3.31	1.10	2.20	0.08	0.00
10	1.37	0.25	4.48	1.58	0.71	1.37	0.09	0.39	0.00	0.00
11	0.05	0.02	0.16	0.16	0.04	0.01	0.00	0.00	0.00	0.00
Total	15.22	1.80	35.08	9.06	4.20	19.87	5.52	9.10	0.08	0.06

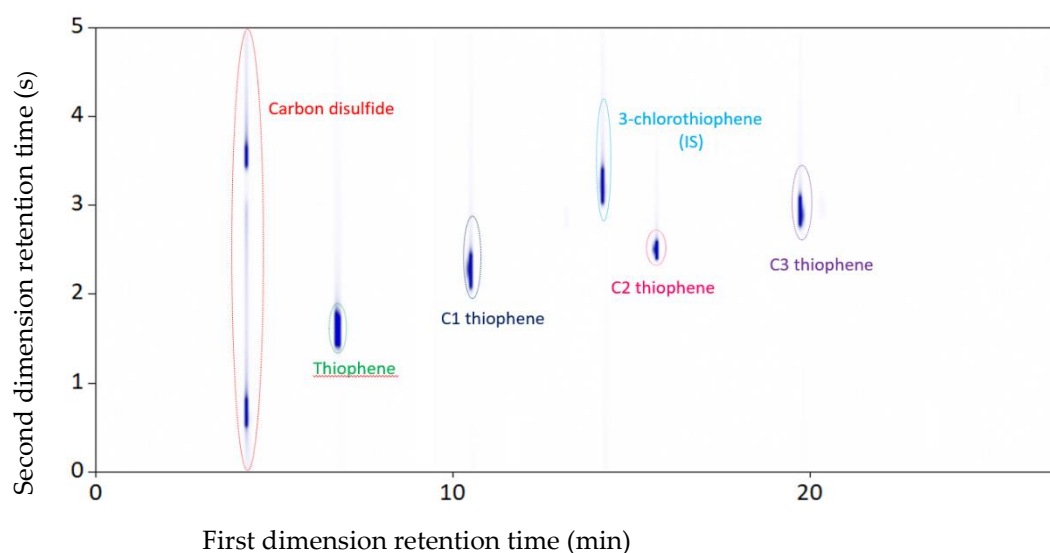


Figure S1. GC × GC - SCD chromatogram of the reference mixture obtained using an RTX-1 PONA column in the first dimension combined with BPX-50 column in the second dimension.

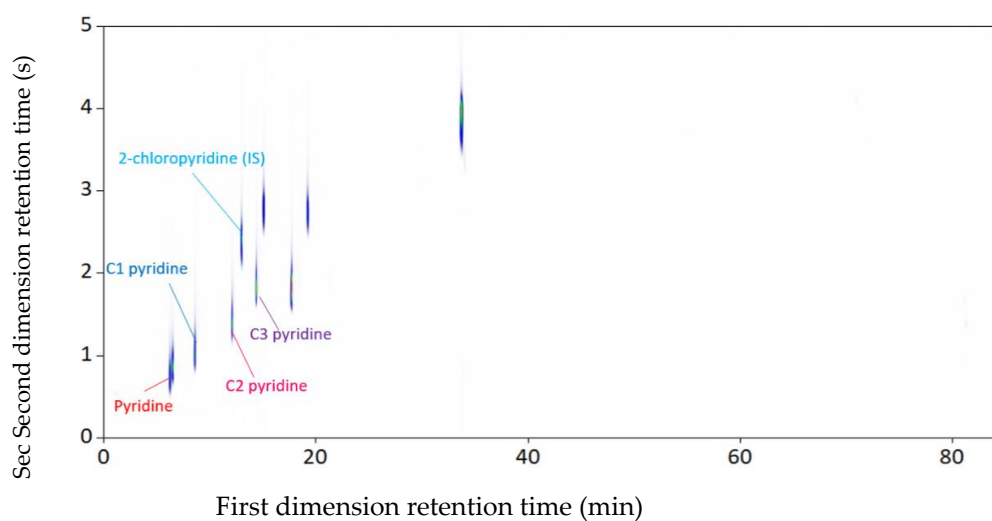


Figure S2. GC × GC - NCD chromatogram of the reference mixture obtained using an RTX-1 PONA column in the first dimension combined with BPX-50 column in the second dimension.