

Supporting Information

**Identification of Novel Phosphorus-Based Flame
Retardants in Curtains Purchased in Japan Using
Orbitrap Mass Spectrometry**

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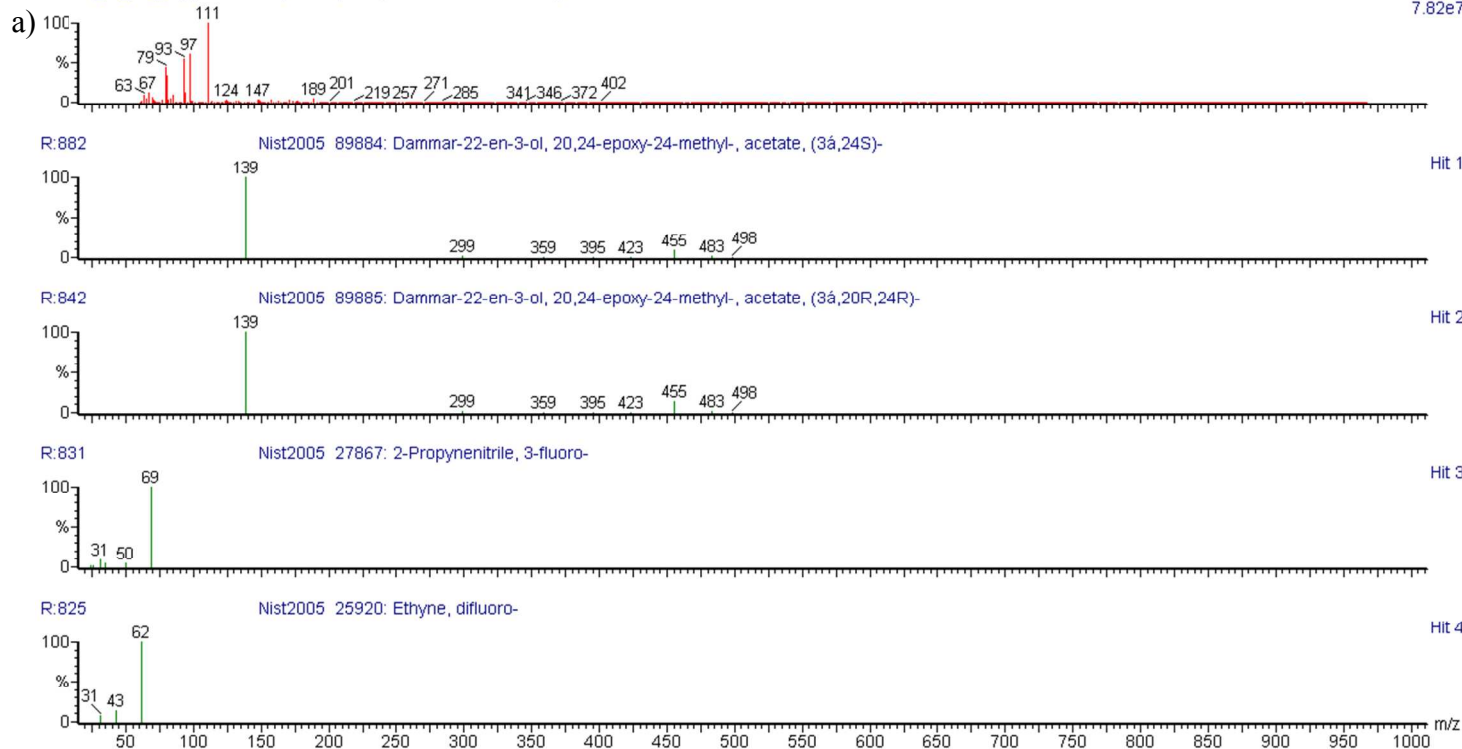
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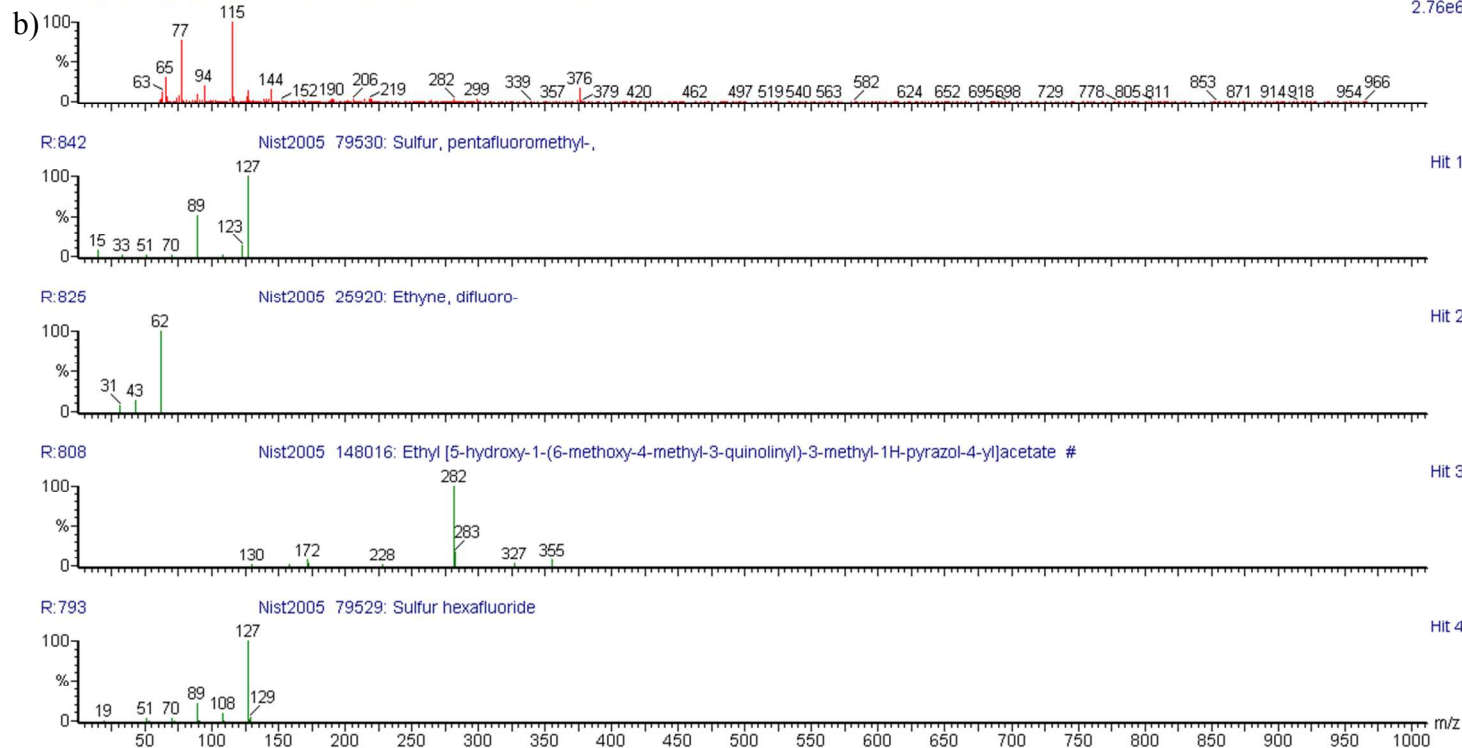
171003_W_std_10ppm-5 1677 (16.263) Cm (1674:1685-1480:1511)

7.82e7



170920_naphthyl_std_10ppm 2622 (23.740) Cm (2621:2630-2292:2348)

2.76e6



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b)

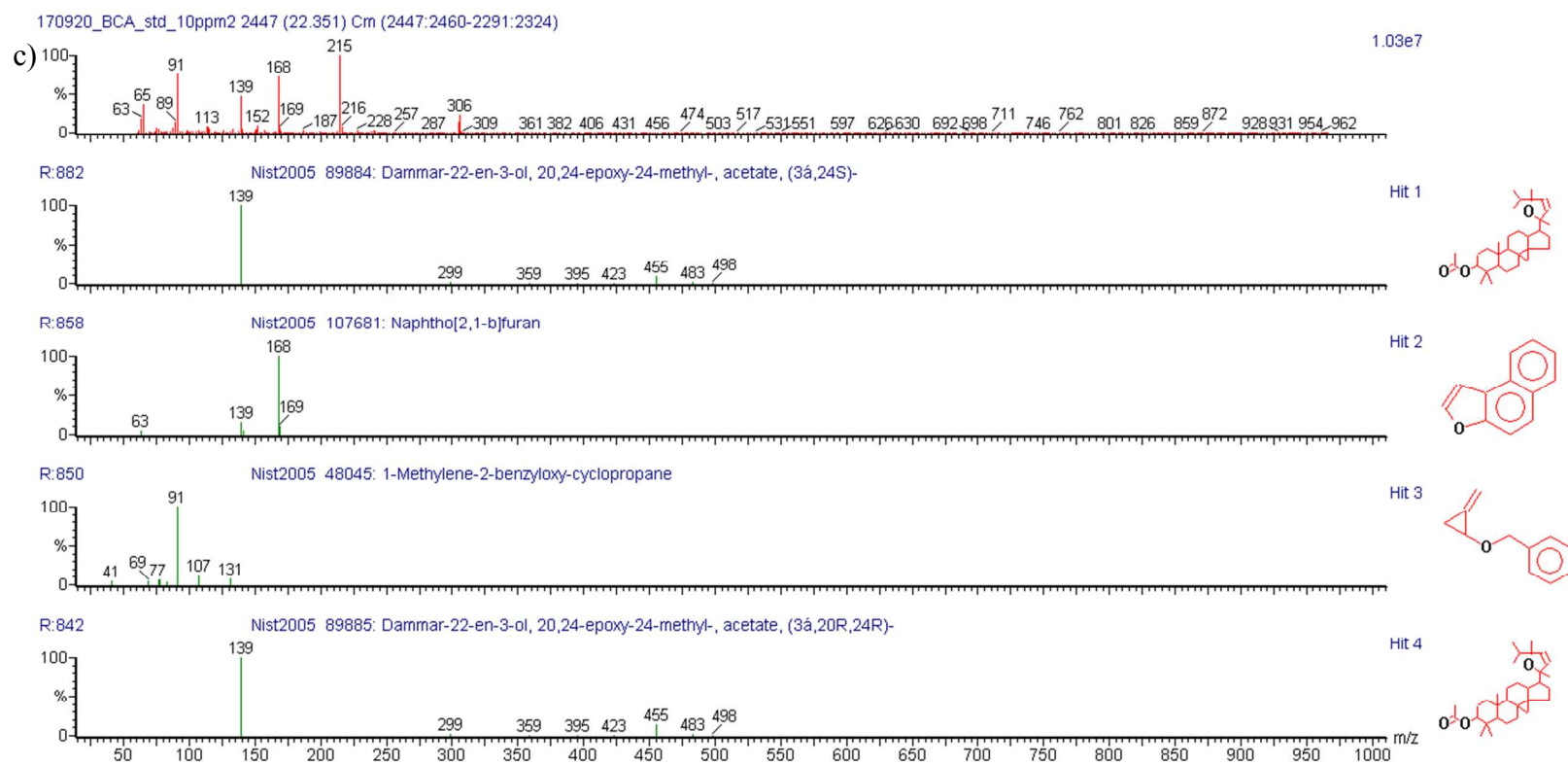
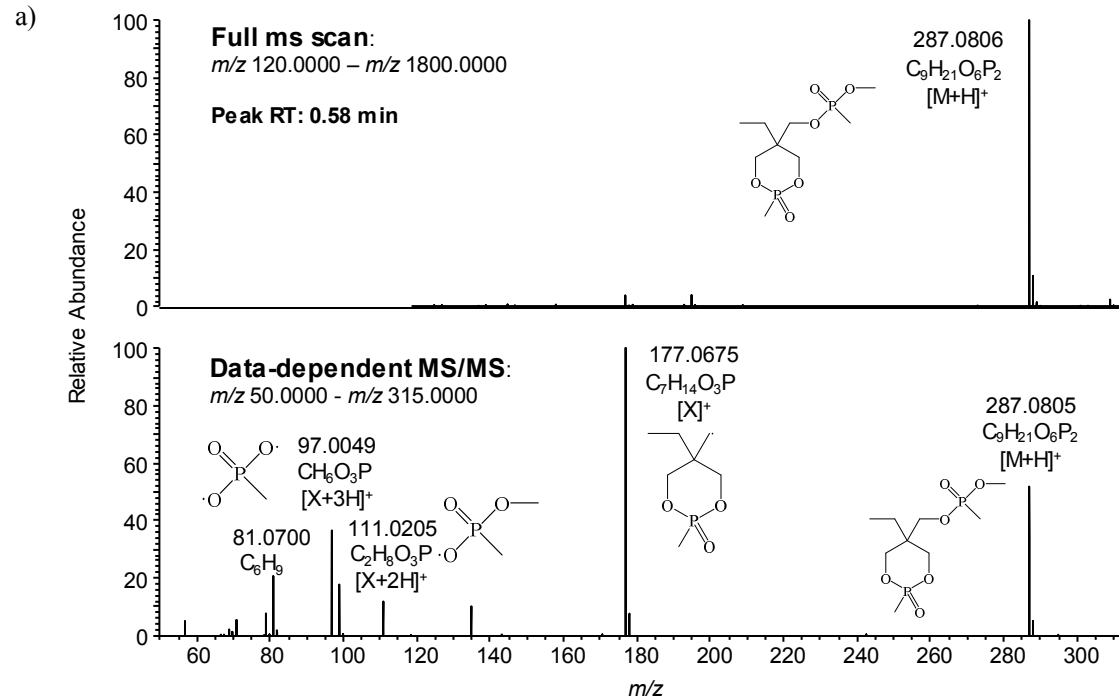
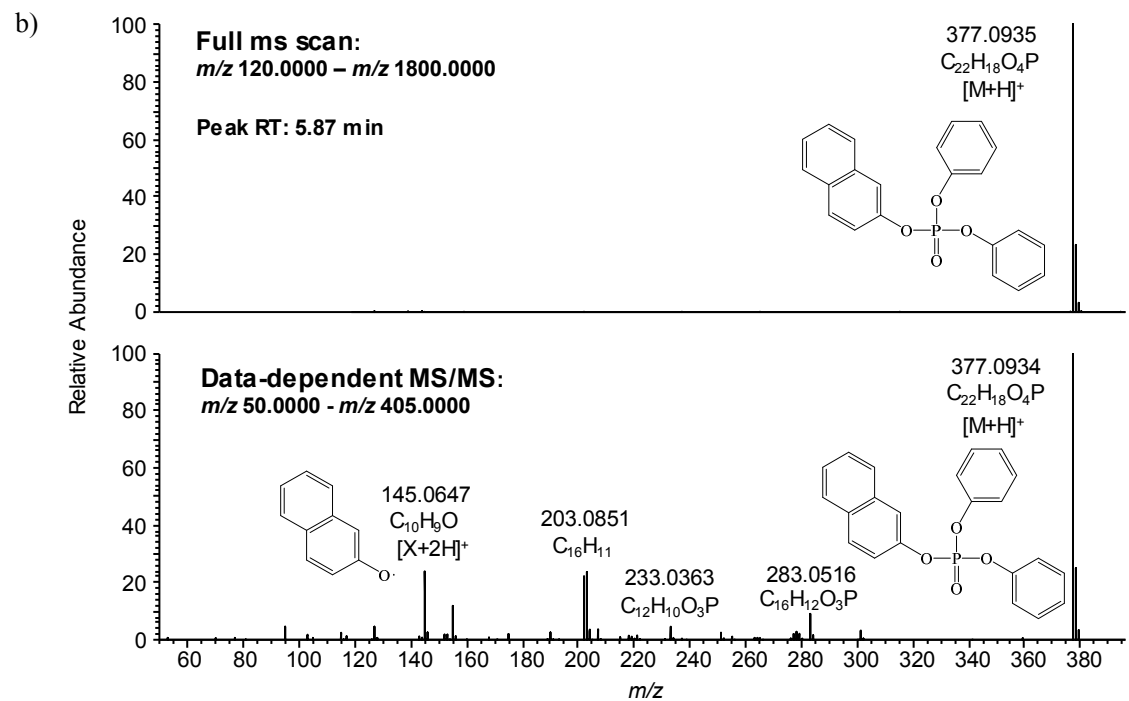
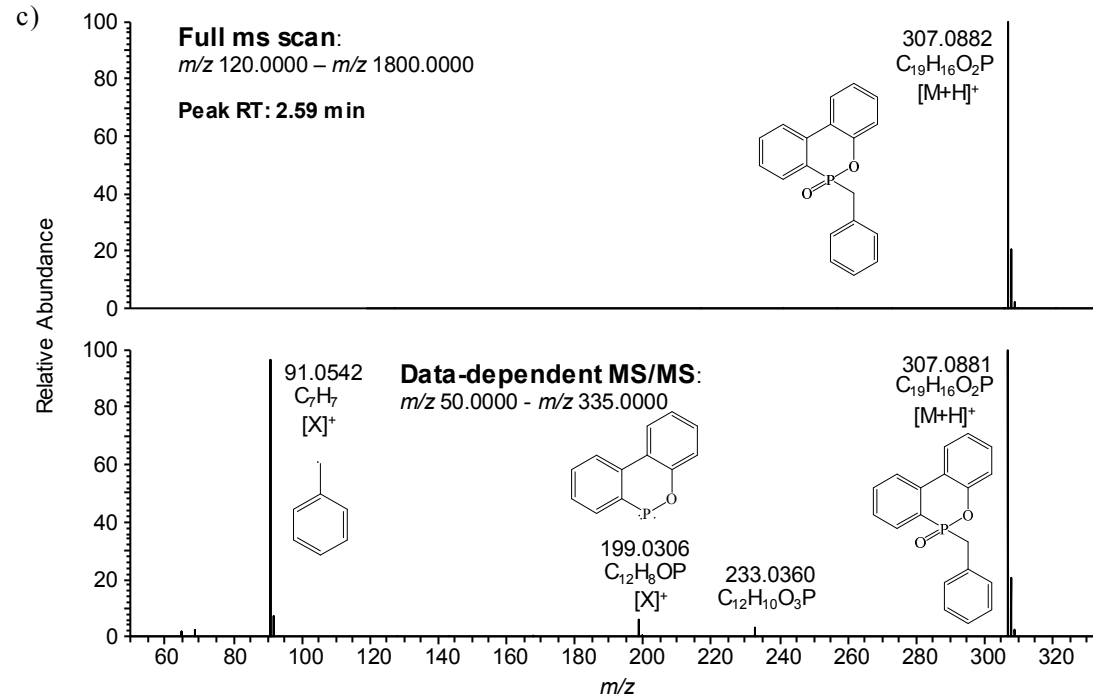


Figure S1 Results of the library search of the National Institute of Standards and Technology mass spectra database (a: curtain 15, b: curtain 17, c: curtain 21).







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30 **Figure S2** Mass spectra obtained by LC-Orbitrap-MS analysis for analytical standards of three novel flame retardants identified in

31 curtain from Japan (a: PMMMP, b: NDPhP, c: BzIDOPO).

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Table S1 Information on curtain samples.¹³

Sample ID	Make	Type	Material	Flame resisting method
1	Japan	Curtain	Polyester 100%	Post processing
2	Japan	Net curtain	Polyester 100%	Post processing
3	Japan	Curtain	Polyester 100%	Post processing
4	Japan	Curtain	Polyester 100%	Post processing
5	Japan	Curtain	Polyester 100%	Post processing
6	Japan	Curtain	Polyester 100%	Post processing
7	Japan	Curtain	Polyester 100%	Post processing
8	Japan	Curtain	Polyester 100%	Post processing
9	Japan	Curtain	Polyester 100%	Post processing
10	Japan	Net curtain	Polyester 100%	Post processing
11	Japan	Curtain	Polyester 100%	Post processing
12	Japan	Curtain	Polyester 97%, Nylon 3%	Post processing
13	Japan	Curtain	Polyester 100%	Post processing
14	Japan	Net curtain	Polyester 100%	Post processing
15	Japan	Curtain	Polyester 100%	Post processing
16	Japan	Curtain	Polyester 100%	Post processing

17	Japan	Net curtain	Polyester 100%	Post processing
18	Japan	Curtain	Polyester 100%	Post processing
19	Japan	Curtain	Polyester 100%	Post processing
20	Japan	Curtain	Polyester 100%	Post processing
			Warp: Polyester 100%	
21	Japan	Net curtain	Weft: Acryl 1%, Nylon 1%, Polyester 98%	Post processing
22	Japan	Net curtain	Polyester 100%	Post processing
23	Japan	Net curtain	Polyester 100%	Post processing
24	Korea	Net curtain	Polyester 100%	Post processing
25	Vietnam	Curtain	Polyester 100%	Flame resistant fabrics
26	China	Curtain	Polyester 100%	Flame resistant fabrics
27	Japan	Net curtain	Polyester 100%	Flame resistant fabrics
28	Japan	Net curtain	Polyester 100%	Flame resistant fabrics
29	Japan	Net curtain	Polyester 100%	Flame resistant fabrics
30	Germany	Curtain	Polyester 100%	Flame resistant fabrics
31	Japan	Curtain	Acryl 61%, Polyester 39%	Flame resistant fabrics

32	Japan	Net curtain	Polyester 100%	Flame resistant fabrics
33	Japan	Curtain	Polyester 100%	Flame resistant fabrics
			Warp: Polyester 100%	
34	Japan	Curtain	Weft: Acryl 97%, Rayon 2%, Polyester 1%	Flame resistant fabrics
35	Japan	Curtain	Polyester 52%, Acryl 48%	Flame resistant fabrics
36	Japan	Curtain	Warp Polyester 100% Weft: Acry 100%	Flame resistant fabrics
			Warp Polyester 100%	
37	Japan	Curtain	Weft: Acryl 98%, Polyester 2%	Flame resistant fabrics
			Warp: Polyester 100%	
38	Japan	Curtain	Weft: Acryl 84%, Polyester 16%	Flame resistant fabrics
39	Japan	Net curtain	Polyester 63%, Acryl 37%	Flame resistant fabrics
40	Japan	Net curtain	Warp Acryl 97%,	Flame resistant fabrics

Polyester 3%
Weft: Acryl 100%

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Table S2 Analytical parameters used for quantitative LC–MS/MS analysis.

Instrument	TSQ Endura
Ionization mode	APCI
Sheath gas (arbitrary unit)	25
Auxiliary gas (arbitrary unit)	5
Sweep gas (arbitrary unit)	0
Ion transfer tube temperature	250 °C
Vaporizer temperature	300 °C
Positive ion discharge current	4 µA
Negative ion discharge current	4 µA

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Table S3 MS parameters used for quantitative LC–MS/MS analysis.

	Mode	Precursor ion [<i>m/z</i>]	Product ion 1 [<i>m/z</i>]	Collision energy 1 [V]	Product ion 2 [<i>m/z</i>]	Collision energy 2 [V]
PMMMP	APCI positive	287.3	177.0	16.0	97.1	26.4
BzlDOPO	APCI positive	307.0	91.2	30.7	199.0	25.0
NDPhP	APCI positive	377.2	202.0	34.4	127.1	41.9

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