Drinking Water Organic Compound Contamination from the Thermal Degradation of Plastics: Implications for Wildfire and Structure Fire Response

Kristofer Isaacson[a], Caitlin R. Proctor[a,c], Erica Wang[b], Ethan Edwards[b], Yoorae Noh[b], Amisha D. Shah[a,b], and Andrew J. Whelton*[,a,b]

[a] Environmental and Ecological Engineering, Purdue University, West Lafayette, Indiana, USA

[b] Lyles School of Civil Engineering, Purdue University, West Lafayette, Indiana, USA

[c] Agricultural and Biological Engineering, Purdue University, West Lafayette, Indiana, USA

* Corresponding author phone: 765-496-2160; fax: 765-494-0395; E-mail: awhelton@purdue.edu

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Table S1: Summary of the maximum contaminant concentrations found in the drinking water distribution network of Santa Rosa and Paradise following Tubbs Fire and Camp Fire, respectively, and a listing of the previous studies that observed various VOCs in the air phase when pyrolyzing different plastic pipe types.

Chemical	Tubbs Fire[1] (ppb)	Camp Fire[1] (ppb)	References associated with VOC formation in the air phase from each pipe type			
			HDPE	PP	PVC	CPVC
1,1-Dichloroethane	1.6	2.5				
1,2-Dichlorobenzene	2.2	0.5			Aracil et al. (2004)[2]	
1,2-Dichloroethane (EDC)	1.5					
1,2,4-Trichlorobenzene		0.54			Aracil et al. (2004)[2]	
1,2,4-Trimethylbenzene	12	3.9				
1,3-Dichloropropane	1.1	0.6				
1,3-Dichloropropene (total)	1.5					
1,3,5-Trimethylbenzene	2.1	8.8	Font et al. (2004)[3]		Aracil et al. (2004)[2]	
2-Butanone	140		Font et al. (2004)[3]			
Acetone	880			Purohit and Orzel, (1988)[4]		
Acetonitrile	9.1					
Acrylonitrile	7,300					
Benzene	40,000	923	Font et al. (2004)[3], Hodgkin et al. (1982)[5], Mitera and Michal (1985)[6]	Purohit and Orzel[4], (1988), Woolley et al. (1979)[7]	Urabe and Imasaka (2000)[8], Aracil et al. (2004)[2], McNeil et al. (1995)[9]	Urabe and Imasaka (2000)[8], Lattimer and Pausch (1983)[10]
Bromodichloromethane	43	6				
Bromoform	8.6					
Bromomethane	7.9	7				
Carbon disulfide	1.3	11.4				

Carbon tetrachloride		0.68					
Chlorobenzene	50	5			Aracil et al. (2004)[2], McNeil et al. (1995)[9]	Urabe and Imasaka (2000)[8], Lattimer and Pausch (1983)[10]
Chloroethane	1.6					
Chloroform	72	125				
4-Chlorotoluene		1.8				
Chloromethane	76					
Dibromochloromethane	17					
Ethylbenzene	106	730	Font et al. (2004)[3], Mitera and Michal (1985)[6]		Urabe and Imasaka (2000)[8], Aracil et al. (2004)[2], McNeil et al. (1995)[9]	Lattimer and Pausch (1983)[10]
Iodomethane	8.9					
Isopropylbenzene	5.1	34				
m,p-Xylene	55	77.7	Font et al. (2004)[3], Mitera and Michal (1985)[6]	Purohit and Orzel[4], (1988), Woolley et al. (1979)[7]	Urabe and Imasaka (2000)[8], Aracil et al. (2004)[2], McNeil et al. (1995)[9]	Lattimer and Pausch (1983)[10]
Methyl ethyl ketone	230					
Methyl *tert*-butyl ether (MTBE)	2.57	2.2				
Methylene chloride	41	28				
n-Butylbenzene	2.3	1.4			McNeil	
n-Propylbenzene	2.2	3.9	Font et al. (2004)[3]		Aracil et al. (2004), McNeil	
Naphthalene	6,800	278	Font et al. (2004)[3], Piao et al. (1999)[11]	Wheatley et al. (1993)[12]	Urabe and Imasaka (2000)[8], McNeil et al. (1995)[9]	Lattimer and Pausch (1983)[10]
o-Xylene	77	50		Purohit and Orzel[4], (1988),	Urabe and Imasaka (2000)[8],	Lattimer and Pausch (1983)[10]

				Woolley et al. (1979)[7]	Aracil et al. (2004)[2], McNeil et al. (1995)[9]	
Sec-Butylbenzene	0	0.8				
Styrene	460	6,800	Font et al. (2004)[3], Mitera and Michal (1985)[6], Piao et al. (1999)[11]	Woolley et al. (1979)[7]	Urabe and Imasaka (2000)[8], Aracil et al. (2004)[2], McNeil et al. (1995)[9]	Lattimer and Pausch (1983)[10]
tert-Butyl Alcohol (TBA)	29	600				
tert-Butylbenzene	0	1				
Tetrahydrofuran	1,100					
Toluene	1,130	1,400	Font et al. (2004)[3], Hodgkin et al. (1982)[5], Mitera and Michal (1985)[6]	Purohit and Orzel, (1988)[4], Woolley et al. (1979)[7]	Aracil et al. (2004)[2], McNeil et al. (1995)[9]	Lattimer and Pausch (1983)[10]
Total Trihalomethanes	116	128.8				
trans-1,3-Dichloropropene	1.5					
Vinyl chloride	16	0.78				

Table S2. List of brand names, purchase dates, and various characteristics of the plastic pipe materials.

Pipe Label	Brand Name	Density (g/cm^3)[a]	Standard Dimension Ratio[b]	ASTM Classification[b]	Purchase Date
PEX-a1-a	Uponor	0.939	9	5106	September 2016
PEX-a1-b	Uponor	0.939	9	5206	July 2019
PEX-a2	Sioux Chief	N/A[c]	9	3006	July 2019
PEX-b	SharkBite	0.959	9	5106	September 2016
PEX-c1-a	NIBCO Inc.	0.955	9	3008	July 2019
PEX-c1-b	NIBCO Inc.	0.955	9	3308	July 2019
PEX-c1-EVOH	NIBCO Inc.	0.952	9	5006	July 2019
HDPE	Polyethylene Technology Inc.	0.959	SIDR 19	4445576C	July 2019
PP	Aquatherm	0.96	7.4	F2389	September 2015
PVC	Charlotte Pipe and Foundry Company	1.40	11	12454	July 2019
CPVC	Spears Coastline Plastics	1.51	11	23447	July 2019

[a] Density information was obtained from manufacturers specification sheets

[b] SDR and ATSM information was printed on each individual pipe

[c] Author was unable to find density data on spec sheets for this particular plastic

Table S3. List of TICs with a NIST spectral library match of >90% for each of the unburned materials extracted in hexane. D indicates that the compound was detected in the sample, whereas ND indicates that the compound was not detected in the sample.

Compound	PEX-a-1 (Retention Time)	PEX-a-1b	PEX-a-2	PEX-b	PEX-c-1a	PEX-c-1b	PEX-C-EVOH	HDPE	PP	CPVC	PVC
Octane	ND	ND	ND	D (5.15)	ND	ND	D (3.21)	ND	ND	ND	ND
Dimethyl heptane	ND	ND	ND	ND	ND	ND	ND	ND	D (5.33)	ND	ND
Piperidine	ND	ND	ND	ND	D (7.64)	D (7.64)	ND	ND	ND	ND	ND
Dioxane	ND	ND	ND	ND	ND	ND	D (7.85)	ND	ND	ND	ND
Decene	ND	ND	ND	ND	ND	ND	D (9.10)	ND	ND	ND	ND
Methyl-nonane	ND	ND	ND	ND	ND	ND	ND	ND	D (9.48)	ND	ND
Decane	ND	ND	ND	D (9.5)	D (8.81)	D (8.79)	D (9.27)	D (9.60)	ND	ND	ND
Ethyl hexanol	ND	ND	ND	ND	ND	ND	ND	ND	ND	D (9.82)	ND
Propanoic acid	ND	ND	ND	ND	ND	ND	D	ND	ND	ND	ND

							(9.49)				
Undecane	ND	ND	ND	D (10.18)	D (10.30)	D (10.32)	ND	ND	ND	ND	ND
Methyl-undecane	ND	ND	ND	ND	ND	ND	ND	ND	D (10.31)	ND	ND
Tridecanol	ND	ND	ND	ND	ND	ND	ND	ND	D (10.75)	ND	ND
Salicylic Acid	ND	ND	ND	ND	ND	ND	D (11.97)	ND	ND	ND	ND
Dodecene	ND	ND	ND	ND	D (11.57)	D (11.57)	D (12.54)	ND	D (11.06)	ND	ND
Dodecane	ND	ND	ND	ND	D (11.70)	D (11.68)	D (12.67)	D (12.67)	ND	ND	ND
Acetic Acid	ND	ND	ND	ND	ND	ND	ND	ND	ND	D (11.91)	ND
Di-tert-butylbenzene	ND	ND	ND	ND	D (12.40)	D (12.42)	ND	ND	ND	ND	ND
Tridecane	D (12.53)	D (12.53)	D (12.53)	D (12.71)	D (12.91)	D (12.92)	D (15.10)	ND	ND	ND	ND
Tetradecene	ND	ND	ND	ND	D	D	D	D	ND	ND	ND

					(13.51)	(13.97)	(15.40)	(15.55)			
Tetradecane	ND	ND	ND	ND	D (14.06)	D (14.05)	D (15.51)	ND	ND	ND	ND
Benzoquinone	ND	ND	ND	ND	D (14.88)	D (14.86)	ND	ND	ND	ND	ND
Pentadecane	D (15.4)	D (15.4)	D (15.4)	D (15.5)	D (15.13)	D (15.20)	ND	ND	ND	ND	ND
Di-tert-butyl-benzoquinone	ND	ND	ND	ND	ND	ND	D (16.50)	ND	D (16.50)	ND	ND
Di-tert-butylphenol	ND	ND	ND	D (16.1)	D (15.28)	D (15.39)	D (16.96)	D	D (17.05)	ND	ND
Octyl Thioglycolate	ND	ND	ND	ND	ND	ND	ND	ND	ND	D (15.96)	ND
Methyl-pentadecane	ND	ND	ND	ND	ND	ND	D (17.64)	ND	ND	ND	ND
Hexadecene	ND	ND	ND	ND	D (16.06)	D (16.07)	D (17.91)	ND	ND	ND	ND
Hexadecane	D (16.8)	D (16.8)	D (16.8)	ND	D (16.14)	D (16.14)	D (17.98)	D (17.99)	ND	ND	ND
Heptadecene	ND	ND	ND	ND	D	D	ND	ND	ND	ND	ND

					(17.93)	(17.89)					
Heptadecane	D (17.9)	D (17.9)	D (17.9)	D (17.65)	D (18.02)	D (17.96)	D (19.99)	ND	ND	ND	ND
Irganox 1010 constituent[a]	ND	ND	ND	ND	D (19.14)	D (19.12)	ND	ND	ND	ND	ND
Octadecene	ND	ND	ND	D (17.85)	D (19.63)	D (19.56)	D (20.14)	ND	ND	ND	ND
Octadecane	D (19.8)	D (19.8)	D (19.8)	D (18)	D (19.69)	D (19.64)	D (20.20)	D (20.20)	ND	ND	ND

[a]Irganox 1010 constituent refers to 7,9-di-tert-butyl-1-oxaspiro[4,5]deca-6,9,diene-2,8-dione.

Table S4. Table of compounds values at 25°C

Compound	log K_{ow}[13]	K_H (L*atm/mol) [13]	Melting Temperature (°C) [13]	Vapor Pressure (25°C) (atm) [13]	Boiling Temperautre (°C) [13]	Solubility (mg/L)[14]
Benzene	2.17	5.47	5.5	0.124	80.1	1790
Toluene	2.69	6.14	-95	0.037	110.6	526
Ethylbenzene	3.2	7.73	-95	0.012	136.2	170
Xylene (o)	3.16	4.99	-25.2	0.009	144.4	170
Xylene (m)	3.3	7.22	-47.8	0.011	139.1	180
Xylene (p)	3.27	6.89	13.3	0.012	138.1	166
Chlorobenzene	2.78	3.85	-45.2	0.016	132	499

Table S5: List of TICs with a NIST spectral library match of >90% for each of the materials burned at 400°C and extracted in hexane. D indicates that the compound was detected in the sample, whereas ND indicates that the compound was not detected in the sample.

Compound	PEX-a-1a (Retention Time)	PEX-a-1b	PEX-a-2	PEX-b	PEX-c1	PEX-c2	PEX-c2-EVOH	HDPE	PP	PVC	CPVC
Toluene	D (3.91)	D (3.91)	D (3.91)	D (3.91)	D (3.91)	D (3.91)	D (3.90)	D (3.84)	ND	D (3.88)	D (3.85)
Methyl-heptane	ND	ND	ND	ND	ND	ND	ND	ND	D (3.9)	ND	ND
Methyl-cyclohexene	D (4.05)	D (4.05)	D (4.05)	D (4.05)	D (4.05)	D (4.05)	D (4.05)	ND	ND	ND	ND
1-Octene	D (4.50)	D (4.53)	D (4.60)	D (4.52)	D (4.60)	D (4.53)	D (4.45)	D (4.52)	ND	ND	ND
Octane	D (4.71)	D (4.74)	D (4.72)	D (4.75)	D (4.72)	D (4.74)	D (4.73)	D (4.74)	ND	ND	D (4.74)
Cyclopentane	ND	ND	ND	ND	ND	ND	ND	ND	D (4.96)	ND	ND
Di-methylheptane	ND	ND	ND	ND	ND	ND	ND	ND	D (5.33)	ND	ND
Ethyl-cyclohexane	ND	ND	ND	ND	ND	ND	D (5.50)	ND	ND	ND	ND

Trimethyl cyclohexane	ND	ND	ND	ND	ND	ND	ND	ND	D (5.54)	ND	ND
Propyl-cyclohexane	ND	ND	ND	ND	ND	ND	ND	ND	D (5.67)	ND	ND
Di-methylheptene	ND	ND	ND	ND	ND	ND	ND	ND	D (5.83)	ND	ND
Trimethyl-cyclohexane	ND	ND	ND	ND	ND	ND	ND	ND	D (6.15)	ND	ND
Ethylbenzene	ND	D (6.25)	D (6.15)	D (6.16)	D (6.15)	D (6.25)	D (6.25)	ND	ND	D (6.25)	D (6.25)
Xylene	D (6.35)	D (6.35)	D (6.32)	D (6.34)	D (6.32)	D (6.35)	D (6.44)	D (6.45)	ND	D (6.45)	D (7.00)
Dimethyl-ethyl phenol	ND	ND	ND	ND	ND	D (6.31)	ND	ND	ND	ND	ND
Dimethyl-pyridine	ND	ND	ND	ND	D (6.61)	D (6.62)	D (6.78)	ND	ND	ND	ND
Nonene	D (6.80)	D (6.80)	D (6.80)	D (6.80)	D (6.80)	D (6.80)	D (6.98)	D (7.00)	ND	ND	ND
Di-ethyloctane	ND	ND	ND	ND	ND	ND	ND	ND	D (7.13)	ND	ND

Nonane	D (6.95)	D (6.95)	D (6.90)	D (6.98)	D (6.90)	D (6.95)	D (7.17)	D (7.18)	ND	D (7.17)	D (7.20)
Methyl-ethyl Benzene	ND	ND	ND	ND	ND	ND	D (7.70)	ND		D (7.77)	D (7.70)
Methyl-heptanone	ND	ND	ND	ND	ND	ND	ND	ND	D (8.15)	ND	ND
Acetic Acid	ND	ND	ND	ND	ND	ND	ND	ND	D (8.26)	ND	ND
n-Propyl-Benzene	ND	ND	D (8.05)	D (8.05)	ND	D (8.01)	D (8.32)	ND	ND	ND	D (8.35)
Benzyl chloride	ND	ND	ND	ND	ND	D (8.05)	ND	ND	ND	ND	ND
Benzaldehyde	ND	ND	ND	ND	ND	D (8.11)	D (8.45)	ND	ND	ND	ND
Trimethyl Benzene	ND	ND	ND	ND	ND	D (8.26)	ND	ND	ND	ND	ND
Methyl styrene	ND	ND	ND	ND	ND	ND	D (8.90)	ND	ND	ND	ND
Methyl-nonane	ND	ND	ND	ND	ND	ND	ND	ND	D (8.52)	ND	ND

Decene	D (8.65)	D (8.66)	D (8.65)	D (8.65)	D (8.65)	D (8.66)	D (9.09)	D (9.11)	ND	ND	ND
Decane	D (8.82)	D (8.88)	D (8.76)	D (8.80)	D (8.76)	D (8.88)	D (9.26)	D (9.27)	ND	D (9.27)	D (9.27)
Octanal	ND	ND	ND	D (8.85)	ND	ND	ND	D (9.33)	ND	ND	ND
Methyl-propyl benzene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	D (10.32)
Di-methylnonane	ND	ND	ND	ND	ND	ND	ND	ND	D (9.47)	ND	ND
Methyl-decane	ND	ND	ND	ND	ND	ND	ND	ND	D (9.55)	ND	ND
Methyl-propyl Benzene	ND	ND	ND	ND	ND	D (9.70)	ND	ND	ND	D (10.05)	ND
n-butyl Benzene	ND	ND	ND	ND	ND	ND	D (10.30)	ND	ND	D (10.52)	ND
Acetophenone	ND	ND	ND	ND	ND	ND	D (10.48)	ND	ND	ND	ND
p-Cresol	ND	ND	ND	ND	ND	ND	D (10.81)	ND	ND	ND	ND

Aniline	ND	ND	ND	ND	ND	ND	D (10.88)	ND	ND	ND	ND
Undecene	D (10.20)	D (10.21)	D (10.20)	D (10.21)	D (10.20)	D (10.21)	D (10.92)	D (10.93)	ND	ND	ND
Undecane	D (10.33)	D (10.32)	D (10.35)	D (10.33)	D (10.35)	D (10.32)	D (11.05)	D (11.07)	ND	D (11.07)	ND
Nonanal	D (10.35)	ND	ND	D (10.4)	D (10.4)	D (10.4)	ND	D (11.15)	ND	ND	ND
Chloro-benzonitrile	ND	ND	ND	ND	ND	D (11.03)	ND	ND	ND	ND	ND
Ethyl-phenol	ND	ND	ND	ND	D (11.24)	ND	ND	D (12.15)	ND	ND	ND
Methyl acetophenone	ND	ND	ND	ND	ND	ND	D (11.23)	ND	ND	ND	ND
Naphthalene	ND	ND	ND	ND	ND	ND	D (12.47)	ND	ND	D (12.49)	D (12.87)
Dodecene	D (11.57)	D (11.58)	D (11.57)	D (11.55)	D (11.57)	D (11.58)	D (12.53)	D (12.55)	ND	ND	ND
Dodecane	D (11.67)	D (11.68)	D (11.67)	D (11.71)	D (11.67)	D (11.68)	D (12.66)	D (12.67)	ND	ND	D (12.86)

Decanal	ND	ND	ND	D (11.75)	ND	D (11.75)	ND	D (12.77)	ND	ND	ND
Di-*tert*-butylbenzene	D (12.4)	ND	ND	D (12.42)	D (12.43)	D (12.42)	ND	ND	ND	ND	ND
Tridecene	D (12.82)	D (12.84)	D (12.82)	D (12.80)	D (12.82)	D (12.84)	D (14.02)	D (14.03)	ND	ND	ND
Tert-butyl Phenol	ND	ND	ND	ND	D (12.86)	D (12.86)	ND	ND	ND	ND	ND
Methyl-tert-butyl Phenol	ND	ND	ND	ND	ND	ND	ND	D (14.06)	ND	ND	ND
Tridecane	D (12.9)	D (14.14)	D (14.13)	D (12.92)	D (12.93)	D (12.92)	D (14.13)	D (14.14)	ND	ND	D (14.15)
Methylnaphthalene	ND	ND	ND	ND	ND	ND	D (14.36)	ND	ND	D (14.15)	ND
2-tert-butyl-4-methylphenol	ND	ND	ND	ND	ND	ND	D (14.88)	ND	ND	ND	ND
Undecanal	ND	ND	ND	ND	ND	ND	ND	D (14.26)	ND	ND	ND
Tetradecene	D (15.38)	D (15.40)	D (15.38)	D (13.97)	D (13.93)	D (13.95)	D (15.38)	D (15.40)	ND	ND	ND

Tetradecane	D (15.48)	D (15.50)	D (15.48)	D (14.06)	D (14.08)	D (14.04)	D (15.48)	D (15.50)	ND	ND	ND
Tetradecanal	ND	ND	ND	ND	ND	ND	ND	D (15.62)	ND	ND	D (15.50)
Pentadecene	D (16.67)	D (16.67)	D (16.67)	D (15.05)	D (15.05)	D (15.10)	D (16.67)	D (16.67)	ND	ND	ND
Pentadecane	D (15.12)	D (15.19)	D (15.12)	D (15.15)	D (15.12)	D (15.19)	D (16.67)	D (16.77)	ND	ND	ND
Di-tert-butyl Phenol	D (15.2)	ND	ND	D (15.28)	ND	D (15.28)	D (16.94)	D (16.96)	ND	ND	D (16.75)
Dodecanoic acid	ND	ND	ND	ND	ND	ND	D (17.08)	ND	ND	ND	ND
Hexadecene	D (16.06)	D (16.06)	D (17.98)	D (16.07)	D (16.07)	D (16.10)	D (17.98)	D (17.90)	ND	ND	ND
Trimethyl Naphthalene	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
Hexadecane	D (16.14)	D (17.99)	D (17.99)	D (16.14)	D (16.13)	D (16.20)	D (17.99)	D (17.99)	ND	ND	D (17.90)
Hexadecanal	ND	ND	ND	ND	ND	ND	ND	D (18.15)	ND	ND	D (18.75)

Heptadecene	D (17.02)	D (17.06)	D (17.06)	D (17.04)	D (17.06)	D (17.10)	D (19.05)	D (19.05)	ND	ND	ND
Heptadecane	D (17.12)	D (17.13)	D (17.13)	D (17.10)	D (17.13)	D (17.20)	D (19.15)	D (19.13)	ND	ND	D (18.19)
Triacontanoic acid	ND	ND	ND	ND	ND	ND	D (19.40)	ND	ND	ND	ND
Pentadecanal	ND	ND	ND	ND	ND	ND	ND	D (19.25)	ND	ND	ND
Octadecene	D (17.94)	D (18.88)	D (18.88)	D (17.94)	D (18.88)	D (17.91)	D (20.15)	D (20.14)	ND	ND	ND
Octadecane	D (18.02)	D (19.05)	D (19.05)	D (18.00)	D (19.05)	D (18.01)	D (20.25)	D (20.22)	ND	ND	D (19.21)
Nonadecene	D (18.02)	D (19.60)	D (19.60)	D (18.8)	D (19.60)	D (18.88)	ND	ND	ND	ND	ND
Nonadecane	D (18.88)	D (19.70)	D (19.70)	D (18.85)	D (19.70)	D (18.90)	ND	ND	ND	ND	D (20.20)

Table S6. List of TICs with a a NIST spectral library match of >90% for each of the materials burned at 400C and extracted in water. D indicates that the compound was detected in the sample, whereas ND indicates that the compound was not detected in the sample.

Compound	PEX-a-1a (Retention Time)	PEX-a-1b	PEX-a-2	PEX-b	PEX-c-1a	PEX-c-1b	PEX-c-1-EVOH	HDPE	PP	CPVC	PVC
Methyl-cyclopentane	D (2.09)	D (2.1)	D (2.1)	D (2.1)	D (2.13)	D (2.08)	D (2.1)	D (2.1)	ND	ND	ND
Benzene	D (2.18)	D (2.15)	D (2.18)	D (2.2)	D (2.23)	D (2.17)	D (2.18)	D (2.2)	ND	ND	ND
Cyclohexane	ND	ND	ND	ND	D (2.42)	D (2.32)	D (2.33)	D (2.37)	ND	ND	ND
Heptane	D (2.51)	D (2.47)	D (2.51)	D (2.51)	D (2.51)	D (2.47)	D (2.45)	D (2.47)	ND	ND	ND
Toluene	D (3.73)	D (3.2)	D (3.35)	ND (3.2)	D (3.90)	D (3.84)	D (3.73)	D (3.82)	ND	ND	ND
1-methyl cyclohexane	ND	ND	ND	ND	ND	D (3.93)	D (3.73)	ND	D (4.1)	ND	ND
Methyl Isobutyl Ketone	D (3.9)	ND	D 3.9	ND	D (4.55)	D (4.45)	D (4.48)	D (4.47)	ND	ND	ND
Ethylbenzene	D (6.02)	D (5.9)	D (5.65)	D (5.65)	D (6.23)	D (6.13)	D (6.13)	D (6.13)	ND	ND	ND

Xylene	D (6.25)	D (6.1)	D (6.0)	D (6.05)	D (6.35)	D (6.30)	D (6.3)	D (6.30)	ND	ND	ND
Styrene	ND	ND	D (6.35)	ND	ND	ND	ND	ND	D (6.50)	ND	ND
Heptanone	ND	ND	D (6.45)	ND	D (6.75)	D (6.78)	D (6.7)	D (6.70)	ND	ND	ND
Xylene (isomer)	ND	ND	D (6.5)	D (6.25)	D (6.85)	D (6.80)	D (6.8)	D (6.80)	ND	ND	ND
1-methyl ethylbenzene	ND	ND	ND	D (7.1)	ND	ND	D (7.45)	ND	ND	ND	ND
1-chloro,3-methylbenzene	ND	ND	ND	ND	ND	D (7.93)	ND	ND	ND	ND	ND
Propyl benzene	ND	ND	D (7.8)	D (7.4)	D (8.03)	D (7.95)	D (8.05)	D (8.05)	ND	ND	ND
1-chloro,4-methylbenzene	ND	ND	ND	ND	ND	D (8.03)	ND	ND	ND	ND	ND
Trimethylbenzene	ND	ND	Nd	ND	ND	D (8.25)	ND	ND	ND	ND	ND

1-ethyl-3 methylbenzene	ND	ND	ND	ND	ND	ND	D (8.46)	ND	ND	ND	ND
Methyl styrene	ND	ND	ND	D (8.15)	ND	ND	D (8.5)	ND	ND	ND	ND
Octanone	D (8.5)	D (8.5)	D (8.5)	D (8.25)	D (8.68)	D (8.65)	D (8.65)	D (8.70)	ND	ND	ND
Hexadiene	ND	ND	ND	ND	ND	ND	ND	ND	D (8.65)	ND	ND
Nonanone	D (10.15)	D (10.15)	D (9.85)	D (10.15)	D (9.93)	D (9.93)	D (10.05)	D (10.25)	ND	ND	ND
1,3-bis(1,1-dimethylethyl)-Benzene	ND	ND	ND	ND	D (10.52)	ND	ND	ND	ND	ND	ND

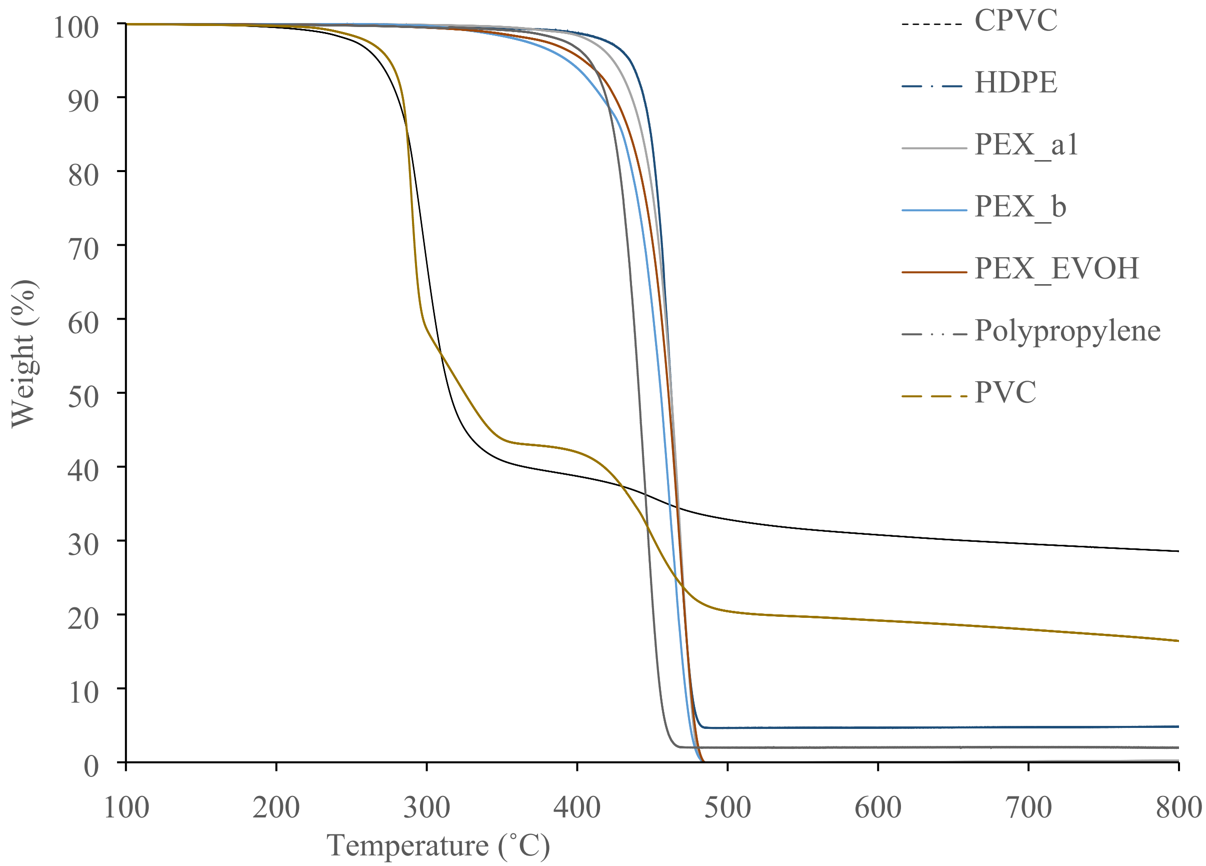


Figure S1. Thermogram for all pipe materials examined in this study from 50 to 1000˚C.

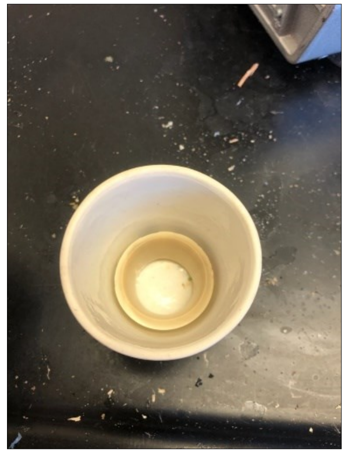
(a)  (b)  (c) 

Figure S2. Pictures of PVC pipe (a) unburned at 300°C, (b) burned at 300°C, and (c) burned at 400°C

(a)  (b) 

Figure S3. Pictures of CPVC pipes (a) unburned and (b) burned at 400°C

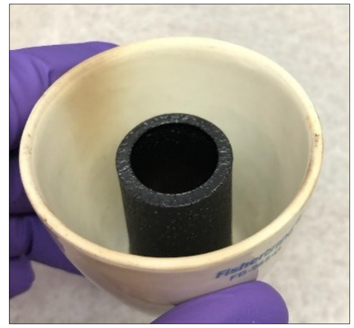
(a)  (b)  (c)  (d) 

Figure S4. Pictures of the PEX-c-1b pipe (a) unburned at 200°C, (b) burned at 200°C, (c) burned at 300°C, and (d) burned at 400°C

(a)  (b)  (c) 

Figure S5. Pictures of HDPE pipe (a) unburned at 300°C, (b) burned at 300°C, and (c) burned at 400°C.

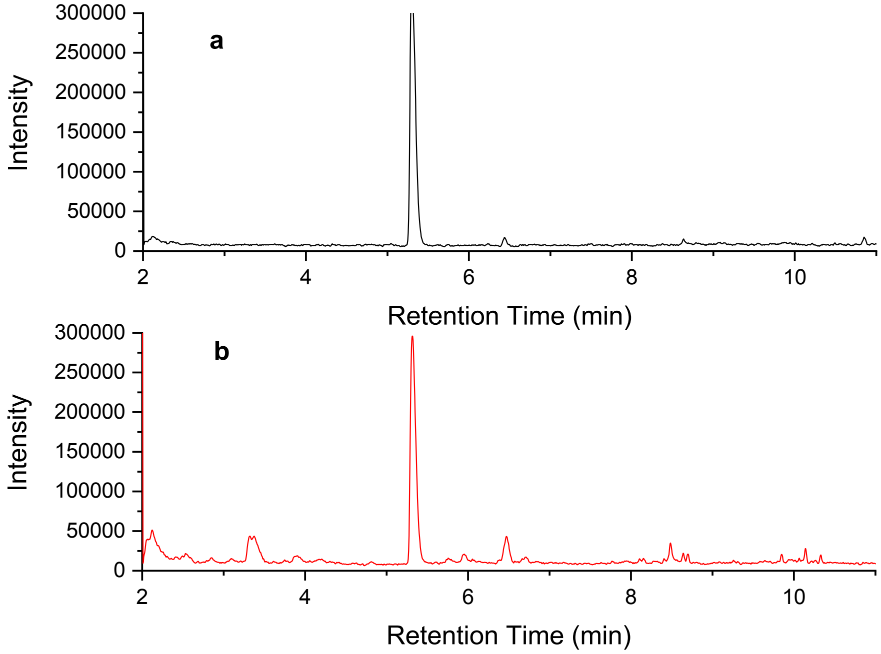


Figure S6. Chromatograms of PEX-a-1a (a) unburned and (b) burned at 400°C and extracted in water. The internal standard is the peak at 5.8 minutes.

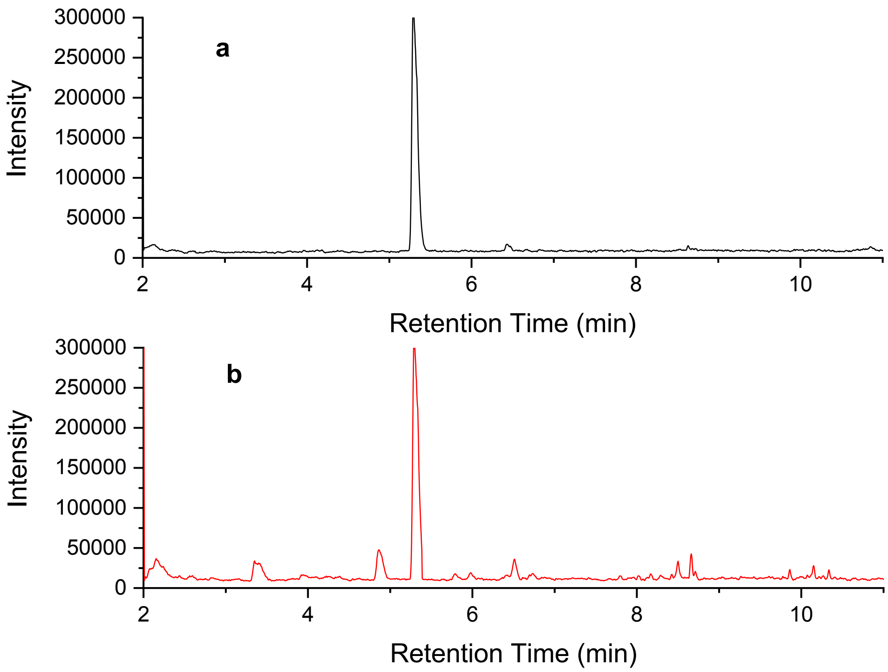


Figure S7. Chromatograms of PEX-a-1b (a) unburned and (b) burned at 400°C and extracted in water. The internal standard is the peak at 5.8 minutes.

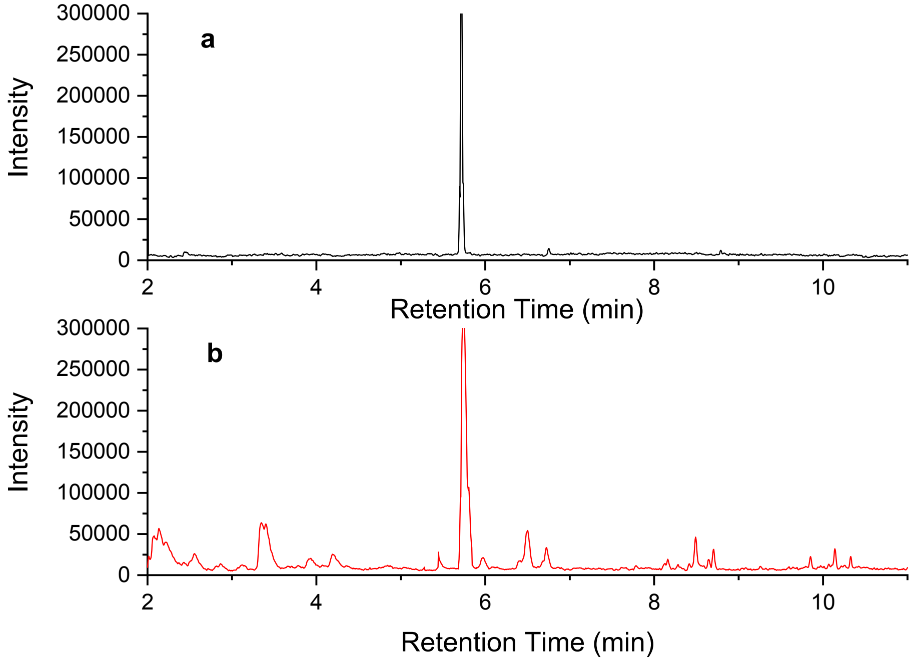


Figure S8. Chromatograms of PEX-a-2 (a) unburned and (b) burned at 400°C and extracted in water. The internal standard is the peak at 5.8 minutes.

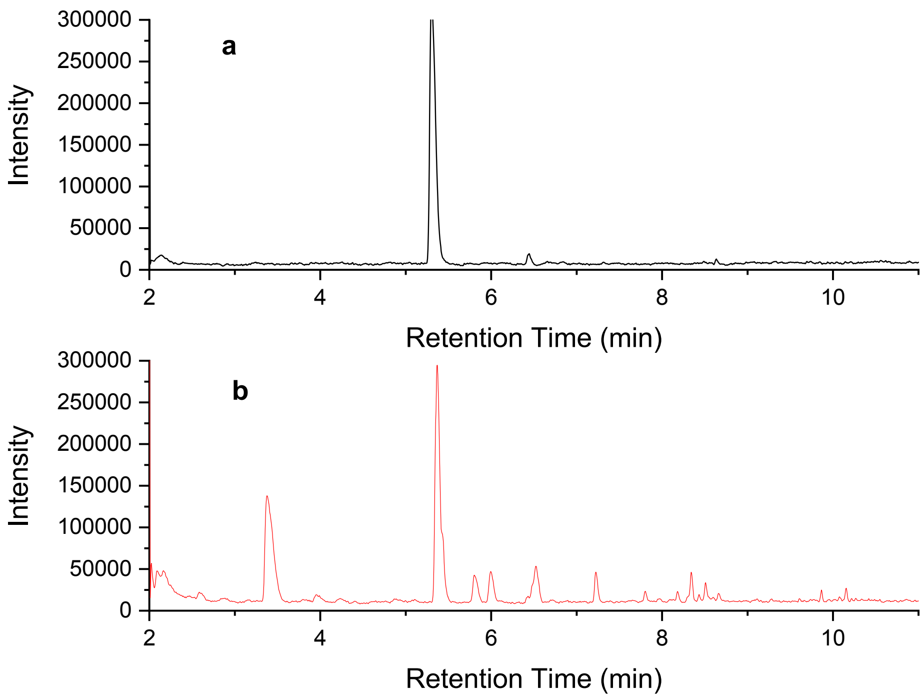


Figure S9. Chromatograms of PEX-b (a) unburned and (b) burned at 400°C and extracted in water. The internal standard is the peak at 5.8 minutes.

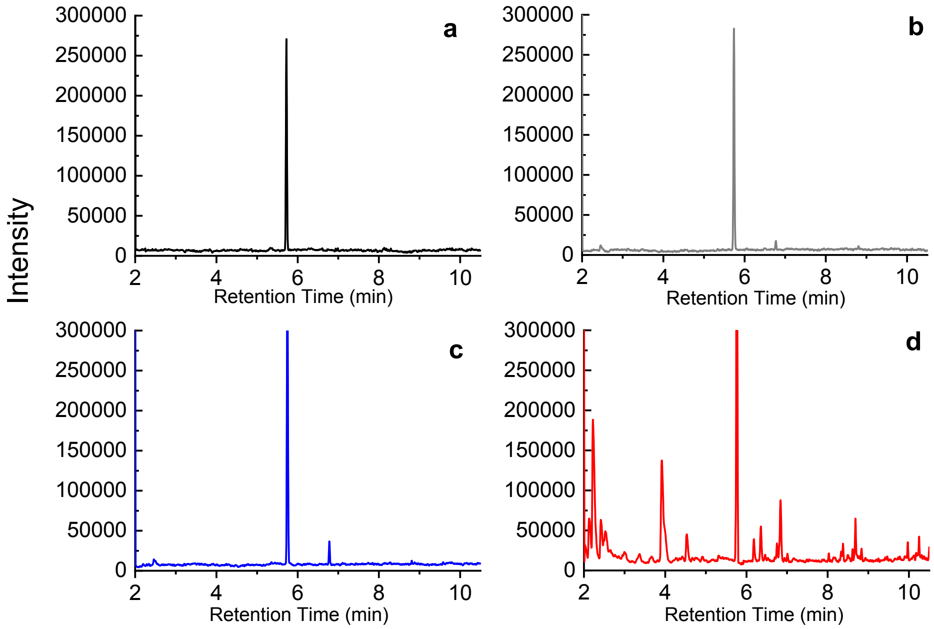


Figure S10. Chromatograms of PEX-c-1a (a) unburned and (b) burned at 400°C and extracted in water. The internal standard is the peak at 5.8 minutes.

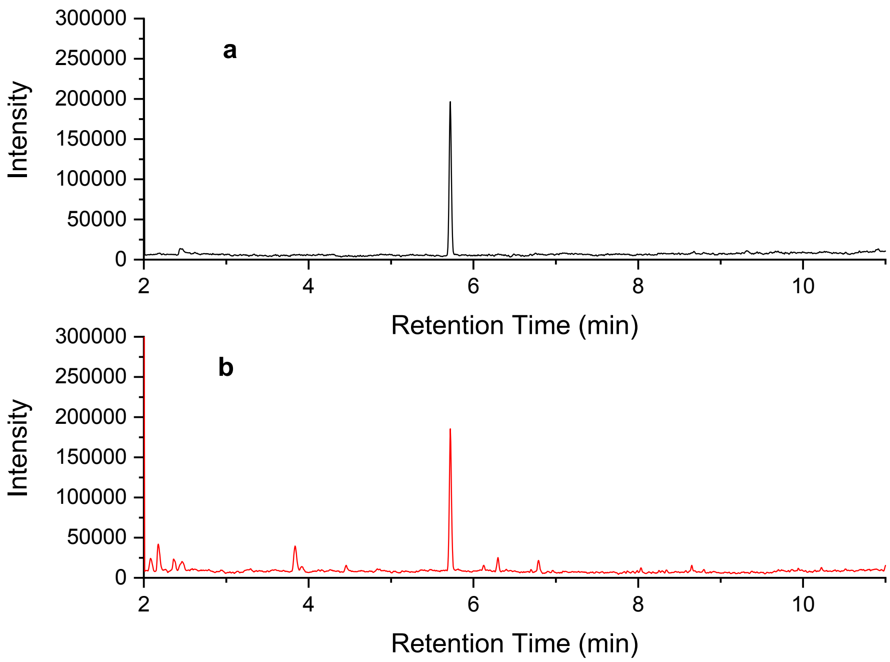


Figure S11. Chromatograms of PEX-c-1b (a) unburned and (b) burned at 400°C and extracted in water. The internal standard is the peak at 5.8 minutes.

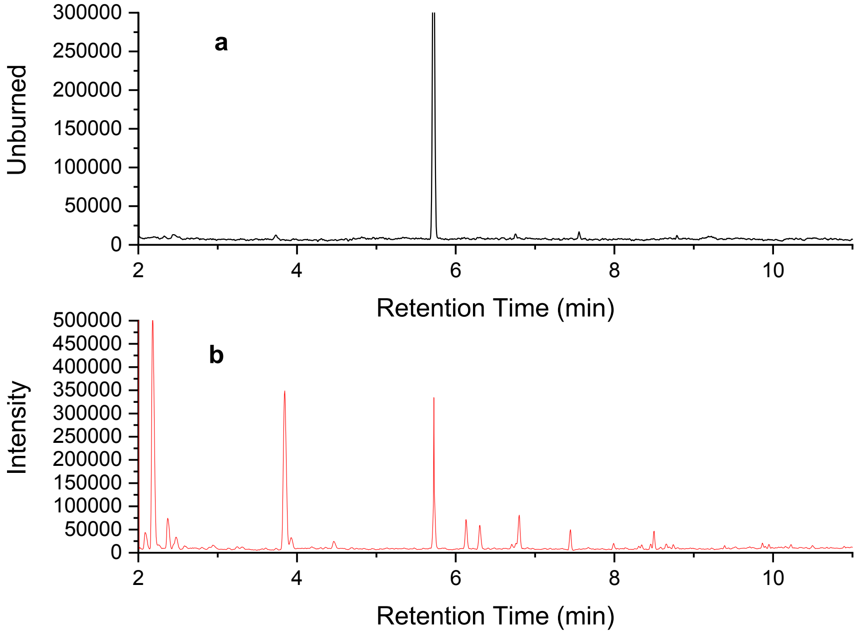


Figure S12. Chromatograms of PEX-c-EVOH (a) unburned and (b) burned at 400°C and extracted in water. The internal standard is the peak at 5.8 minutes.

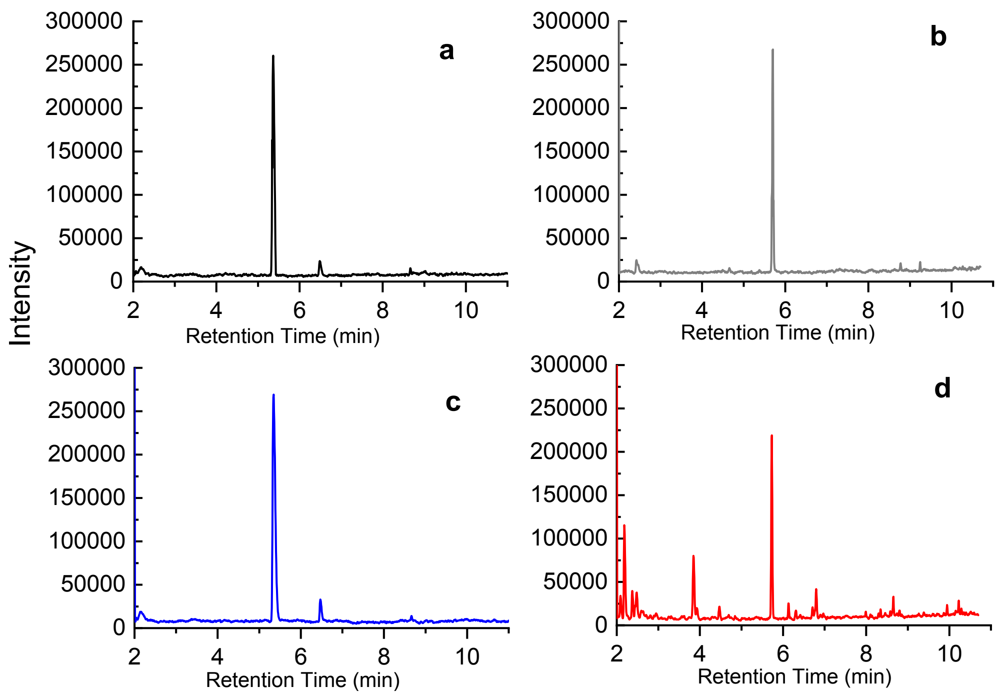


Figure S13. Chromatograms of HDPE (a) unburned and burned at (b) 200°C, (c) 300°C, and (d) 400°C and extracted in water. The internal standard peak is at 5.8 minutes.

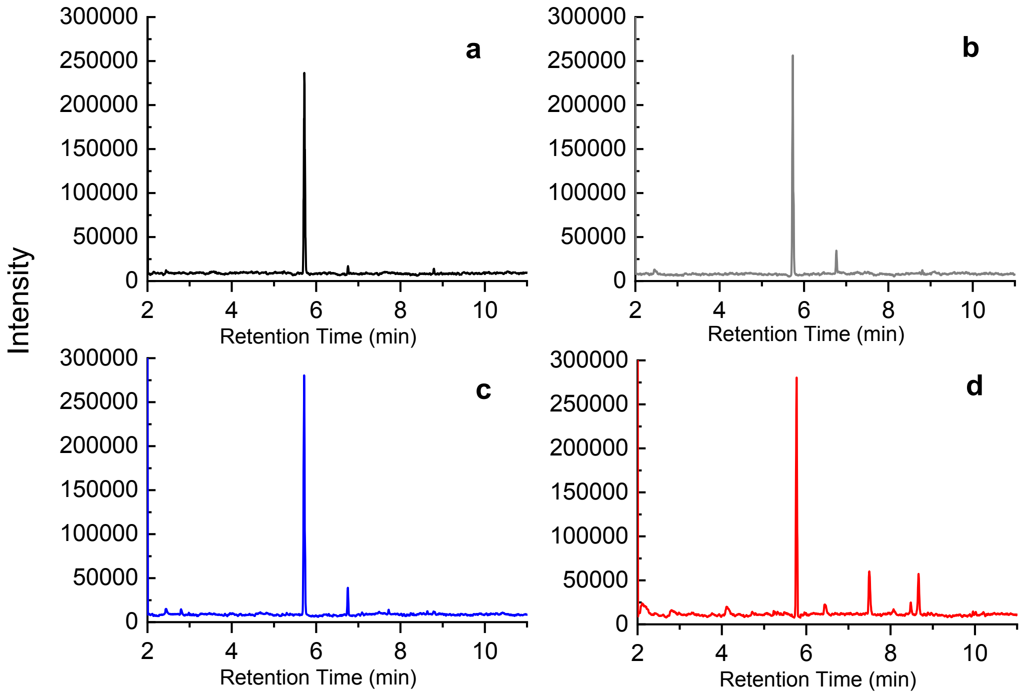


Figure S14. Chromatograms of PP (a) unburned and burned at (b) 200°C, (c) 300°C, and (d) 400°C and extracted in water. The internal standard peak is at 5.8 minutes.

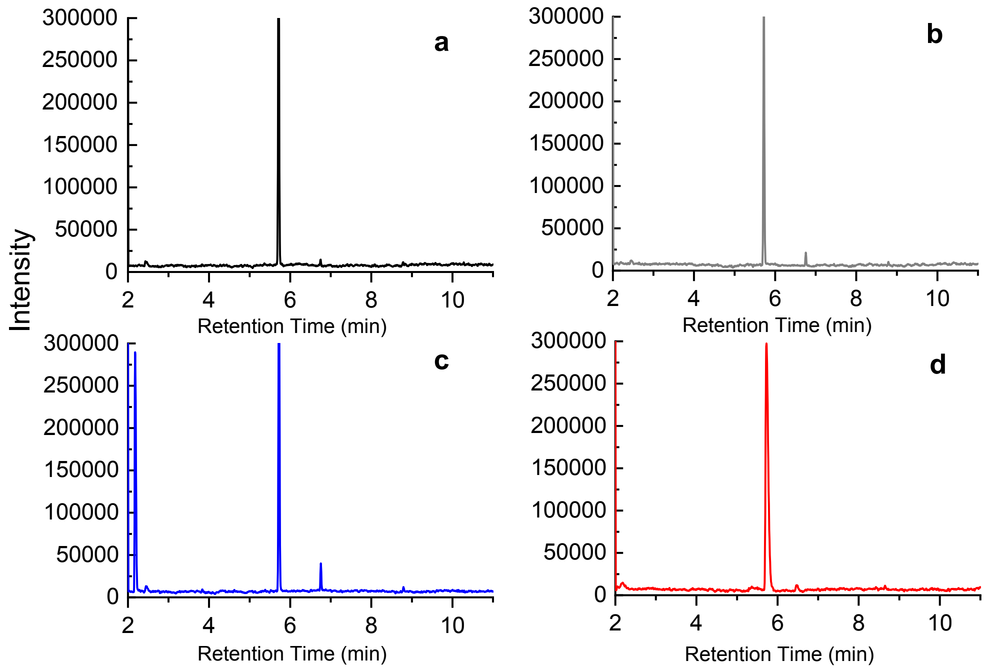


Figure S15. Chromatograms of PVC (a) unburned and burned at (b) 200°C, (c) 300°C, and (d) 400°C and extracted in water. The internal standard peak is at 5.8 minutes.

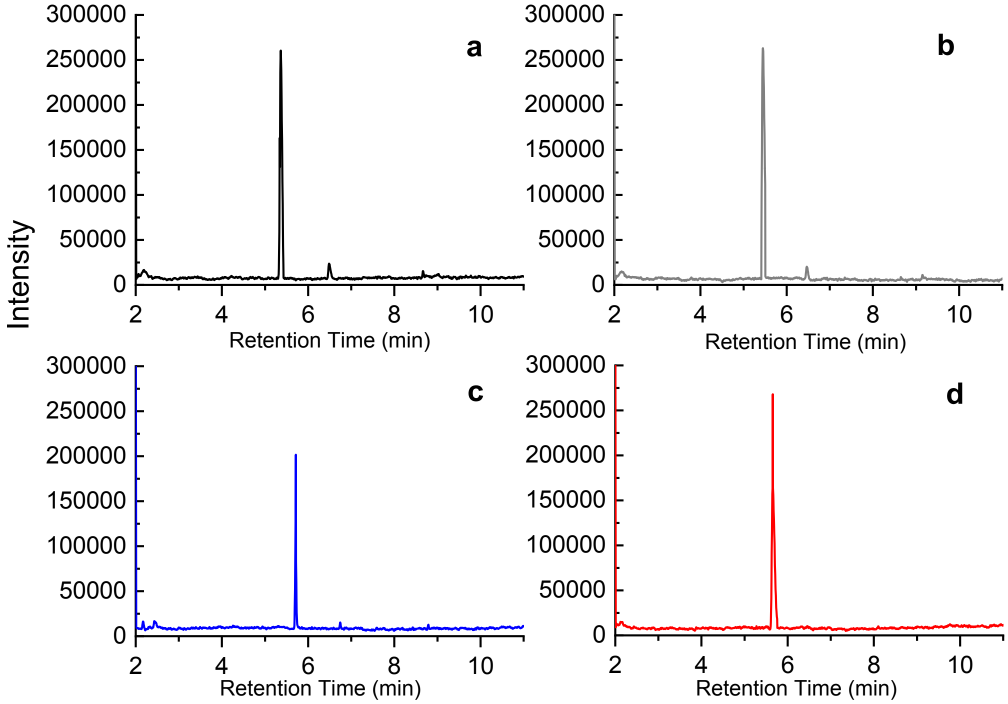


Figure S16. Chromatograms of CPVC (a) unburned and burned at (b) 200°C, (c) 300°C, and (d) 400°C and extracted in water. The internal standard peak is at 5.8 minutes.

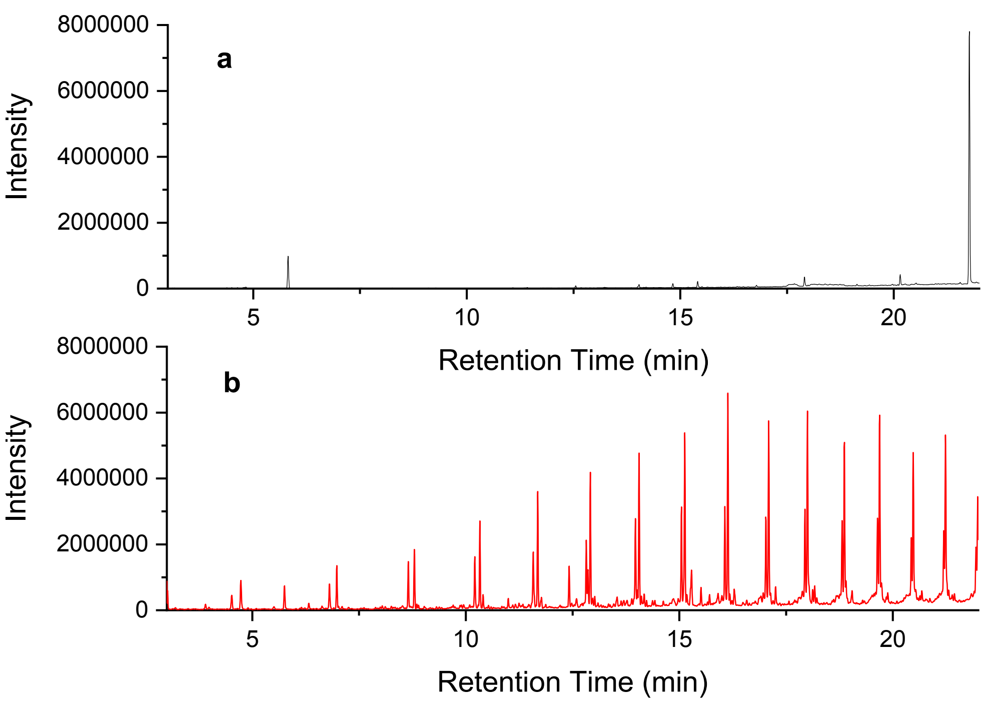


Figure S17. Chromatograms of PEX-a-1a (a) unburned and (b) burned at 400°C and extracted in *n*-hexane. The internal standard is the peak at 5.8 minutes.

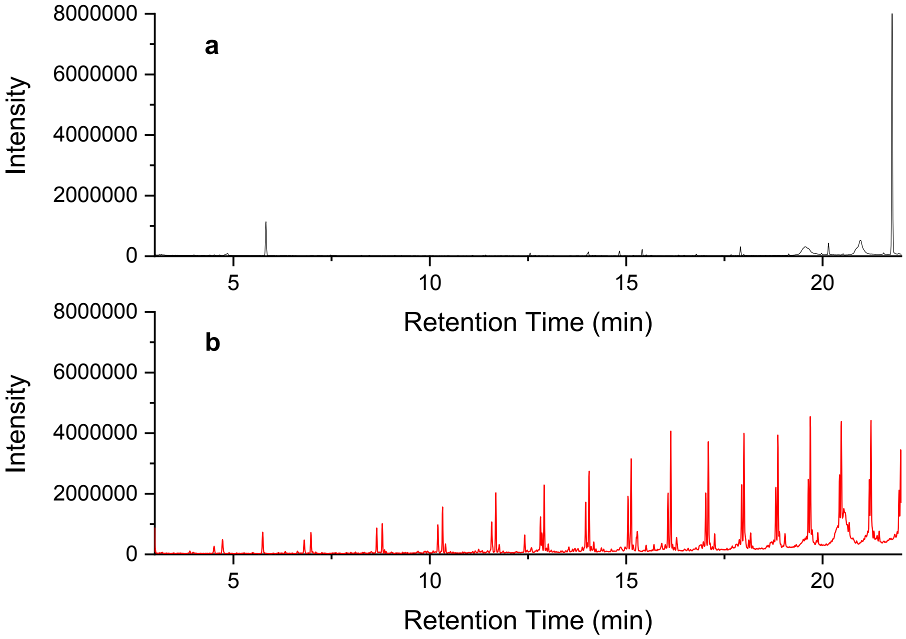


Figure S18. Chromatograms of PEX-a-1b (a) unburned and (b) burned at 400°C and extracted in *n*-hexane. The internal standard is the peak at 5.8 minutes.

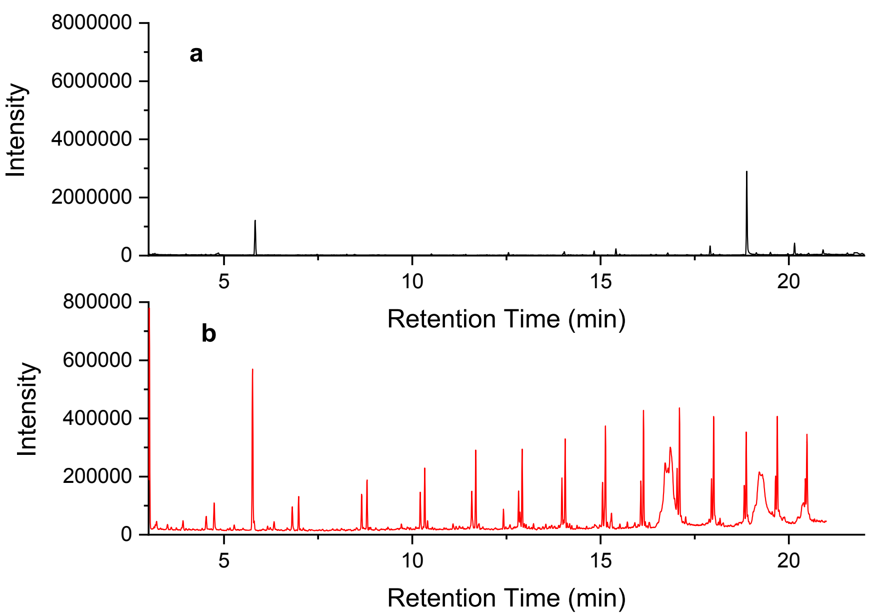


Figure S19. Chromatograms PEX-a-2 (a) unburned and (b) burned at 400°C and extracted in *n*-hexane. The internal standard is the peak at 5.8 minutes.

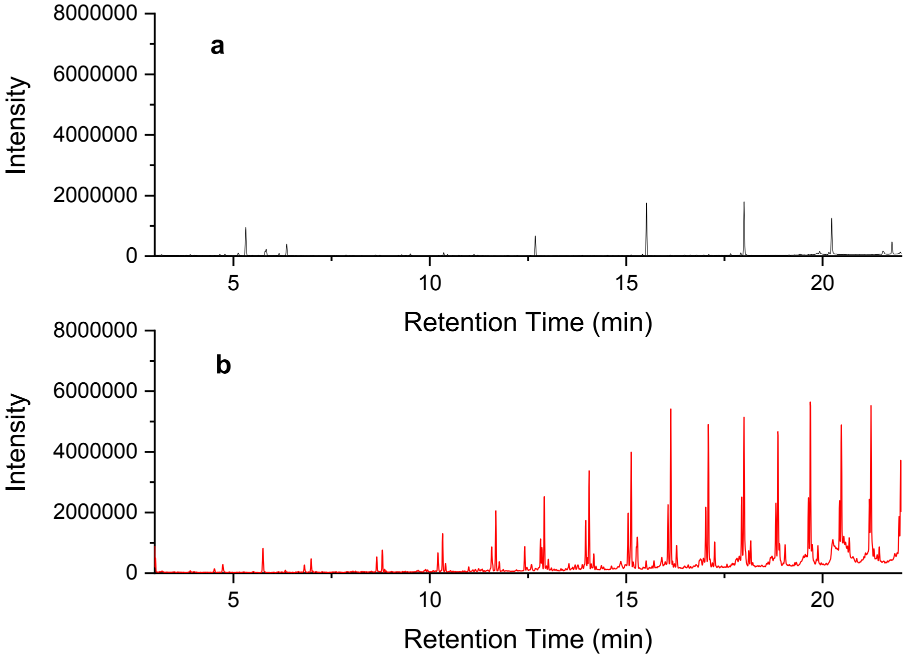


Figure S20. Chromatogram of PEX-b (a) unburned and (b) burned at 400°C and extracted in *n*-hexane. The internal standard is the peak at 5.8 minutes.

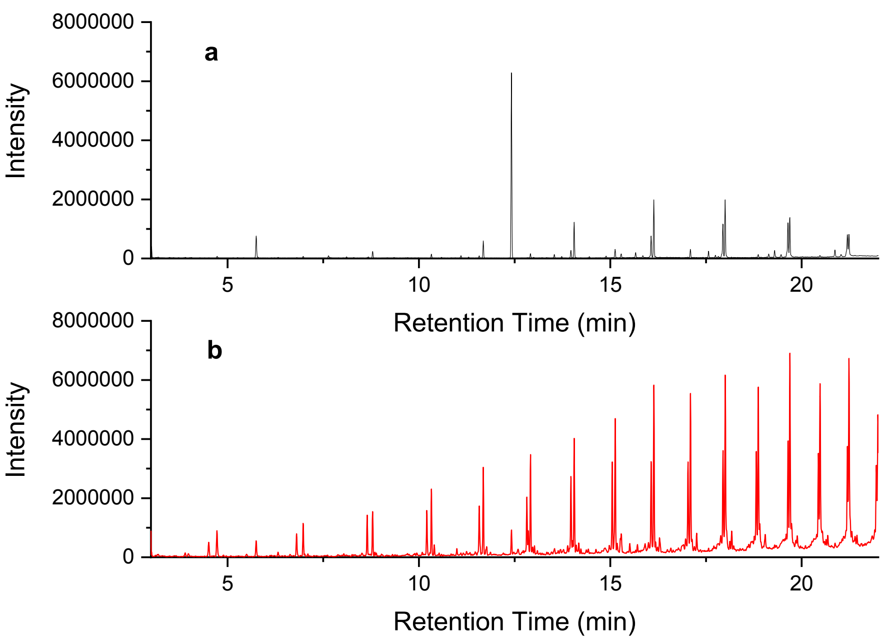


Figure S21. Chromatograms PEX-c-1b (a) unburned and (b) burned at 400°C and extracted in *n*-hexane. The internal standard is the peak at 5.8 minutes.

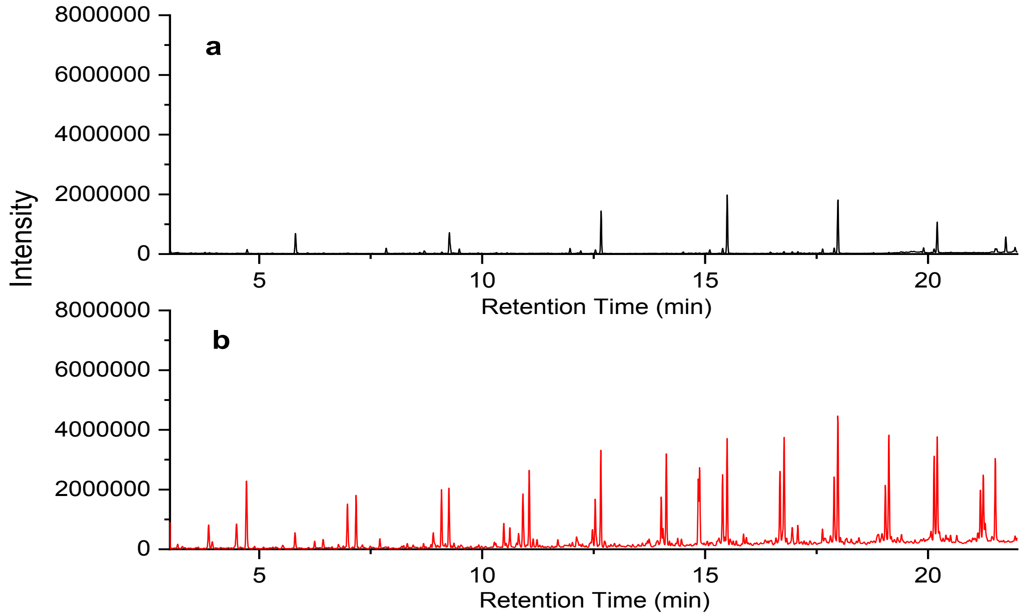


Figure S22. Chromatograms of PEX-c-EVOH (a) unburned and (b) burned at 400°C and extracted in *n*-hexane. The internal standard is the peak at 5.8 minutes.

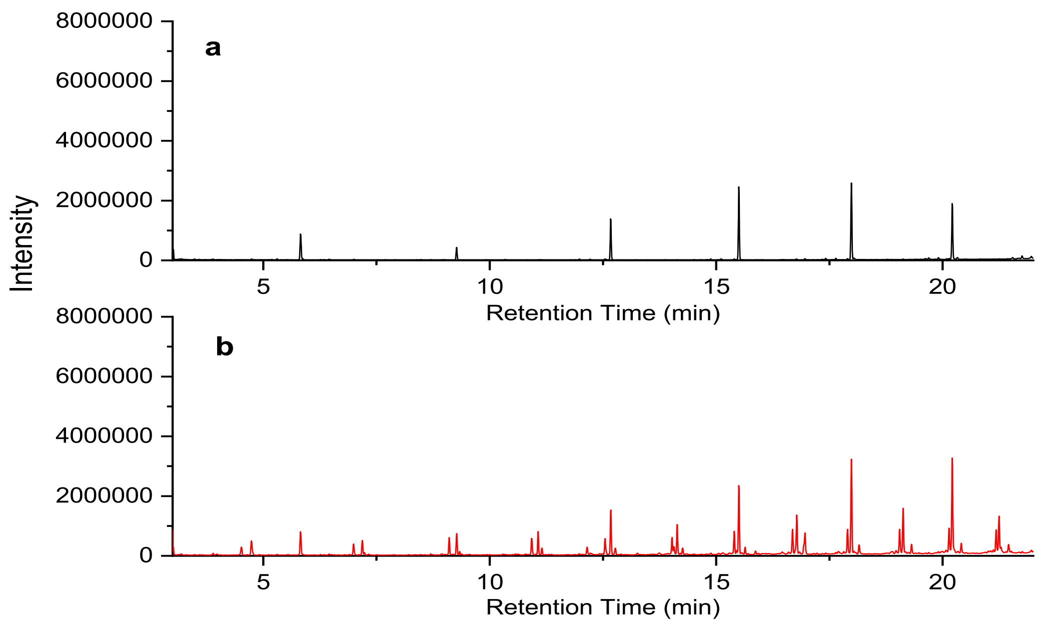


Figure 23. Chromatograms of HDPE (a) unburned and (b) burned at 400°C and extracted in *n*-hexane. The internal standard is the peak at 5.8 minutes.

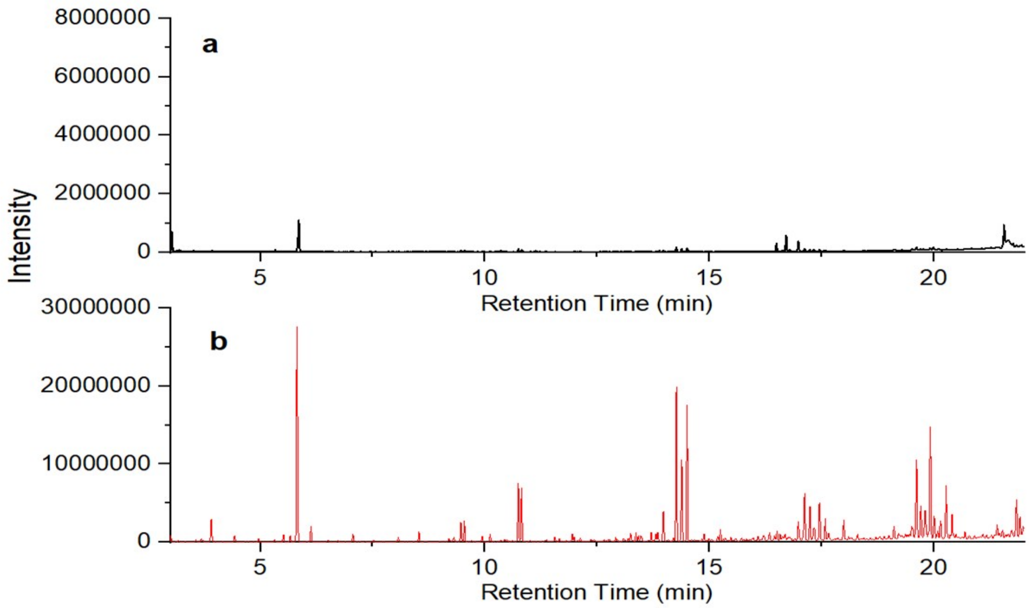


Figure S24. Chromatograms of PP (a) unburned and (b) burned at 400°C and extracted in *n*-hexane. The internal standard is the peak at 5.8 minutes.

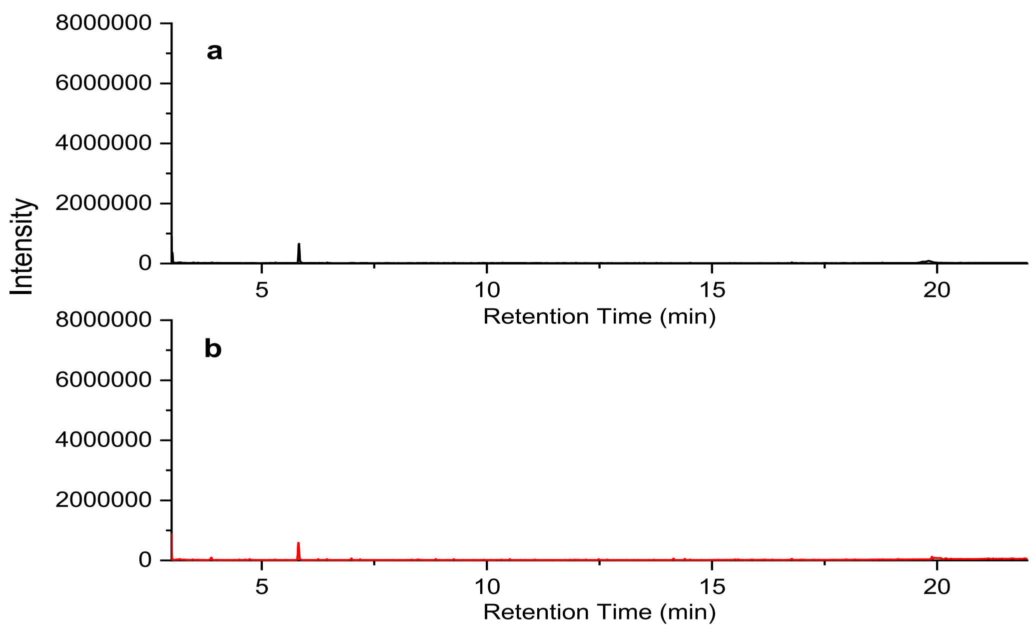


Figure S25. Chromatograms of PVC (a) unburned and (b) burned at 400°C and extracted in *n*-hexane. The internal standard is the peak at 5.8 minutes.

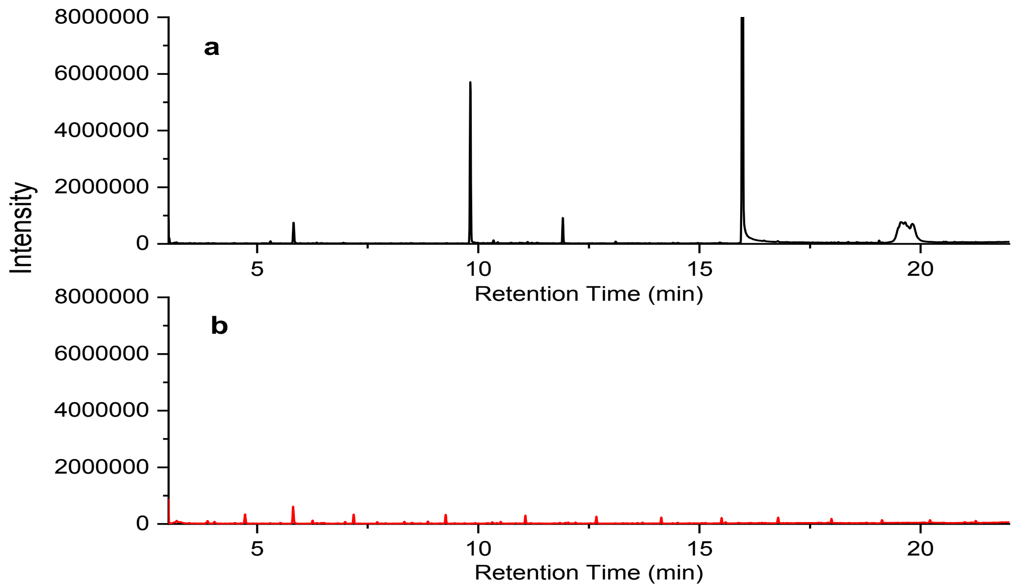


Figure S26. Chromatograms of CPVC (a) unburned and (b) burned at 400°C and extracted in *n*-hexane. The internal standard is the peak at 5.8 minutes.

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