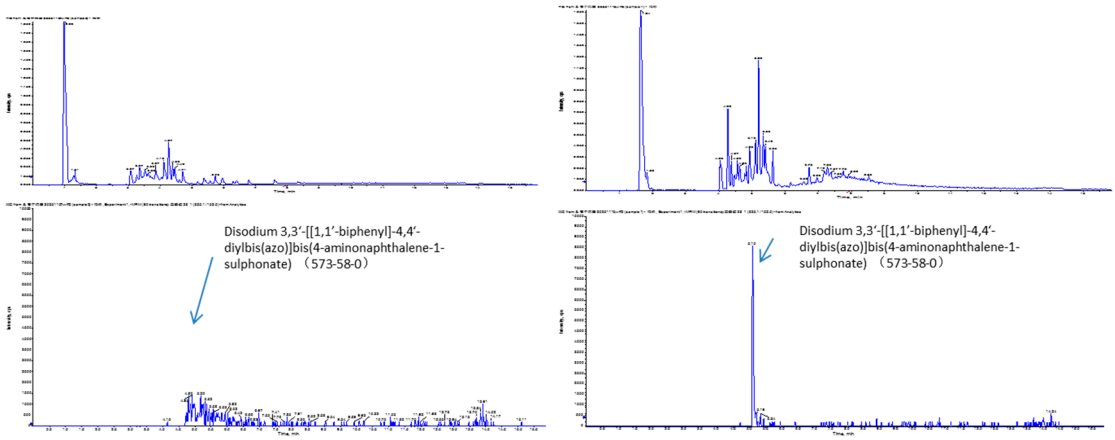
Supporting Information



Agilent ZORBAX RRHD Eclipse Plus C18 Poroshell 120 AQ-C18

Figure S1 Top: Total ion chromatograms obtained with two different chromatographic columns; Bottom: The extraction results of one target analyte (number 26, CAS:573-58-0) showed undetected and detected status respectively.

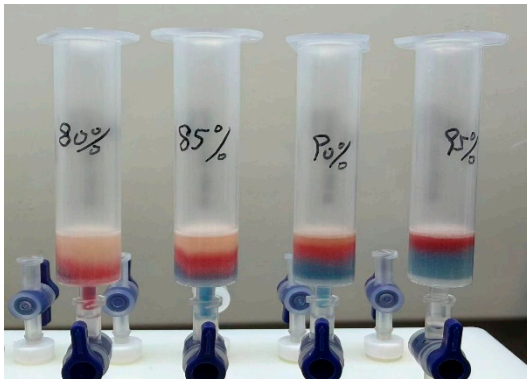


Figure S2 Elution performance of Captiva EMR-Lipid HF purification column with different concentration eluents

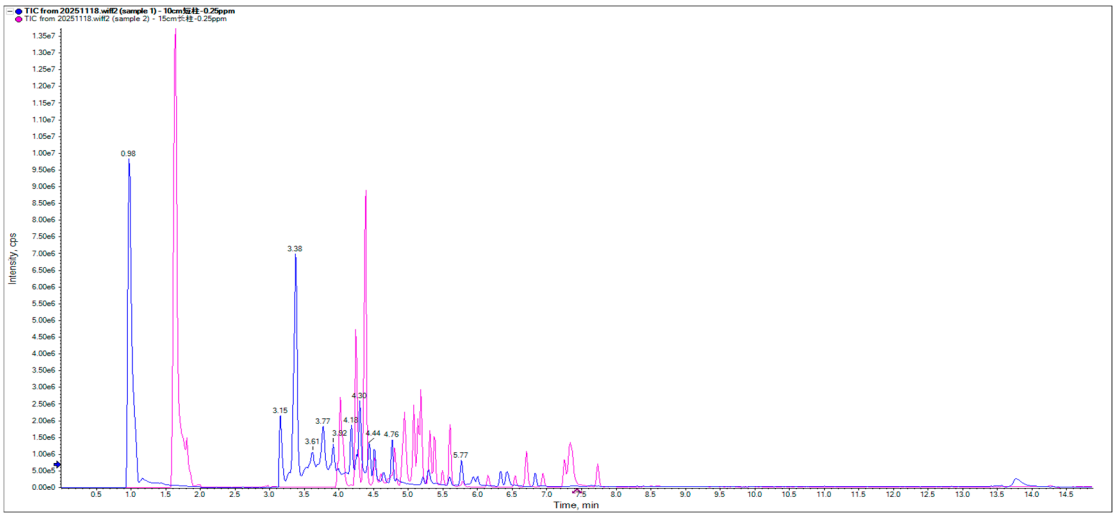


Figure S3 Total ion current chromatogram of 45 pigments and preservatives.

Table S1 The test numbers, compound names and corresponding CAS numbers of the 45 analytes.

Analyte compound No.	CAS	Compound Name
1	77-92-9	2-hydroxypropane-1,2,3-tricarboxylic acid
2	1934-21-0	1H-Pyrazole-3-carboxylic acid, 4,5-dihydro-5-oxo-1-(4-sulfophenyl)- 4-[(4-sulfophenyl)azo]-, trisodium salt
3	220658-76-4	Trisodium 5-acetamido-4-hydroxy-3-[(E)-(4-sulfonatophenyl)diazenyl]-2,7-naphthalenedisulfonate
4	915-67-3	trisodium;3-oxo-4-[(4-sulfonatonaphthalen-1-yl)hydrazinylidene]naphthalene-2,7-disulfonate
5	1390-65-4	trisodium;(8Z)-7-oxo-8-[(4-sulfonatonaphthalen-1-yl)hydrazinylidene]naphthalene-1,3-disulfonate 3,5,6,8-tetrahydroxy-1-methyl-9,10-dioxo-7-[(2S,3R,4R,5S,6R)-3,4,5-trihydroxy-6-(hydroxymethyl)oxan-2-yl]anthracene-2-carboxylic acid
6	8004-92-0	disodium;2-(1,3-dioxoinden-2-yl)quinoline-6,8-disulfonate
7	860-22-0	disodium 5,5'-(2-(1,3-dihydro-3-oxo-2H-indazol-2-ylidene)-1,2-dihydro-3H-indol-3-one)disulphonate
8	65-85-0	Benzoic acid
9	2783-94-0	disodium 6-hydroxy-5-[(4-sulphonatophenyl)azo]naphthalene-2-sulphonate
10	25956-17-6	disodium;(5Z)-5-[(2-methoxy-5-methyl-4-sulfonatophenyl)hydrazinylidene]-6-oxonaphthalene-2-sulfonate
11	846-70-8	disodium;5,7-dinitro-8-oxidonaphthalene-2-sulfonate
12	3734-67-6	Sodium 5-acetamido-4-hydroxy-3-(phenyldiazenyl)naphthalene-2,7-disulfonate
13	110-44-1	SORBIC ACID
14	7295-85-4	2-(3,4-dihydroxyphenyl)-3,4-dihydro-2H-chromene-3,5,7-triol
15	4553-89-3	disodium;4,4'-[[2,4-dihydroxy-5-(hydroxymethyl)-1,3-phenylene]bis(azo)]bisnaphthalene-1-sulphonate
16	547-57-9	4-((2,4-dihydroxyphenyl)azo)-benzenesulfonicacimonosodiumsalt
17	3567-69-9	disodium;(3Z)-4-oxo-3-[(4-sulfonatonaphthalen-1-yl)hydrazinylidene]naphthalene-1-sulfonate
18	2353-45-9	disodium;2-[[4-[ethyl-[(3-sulfonatophenyl)methyl]amino]phenyl]-[4-[ethyl-[(3-sulfonatophenyl)methyl]azaniumylidene]cyclohexa-2,5-dien-1-ylidene]methyl]-5-hydroxybenzenesulfonate
19	4548-53-2	Disodium (3E)-3-[(2,4-dimethyl-5-sulfonatophenyl)hydrazinylidene]-4-oxonaphthalene-1-

		sulfonate
20	3761-53-3	disodium;4-[(2,4-dimethylphenyl)hydrazinylidene]-3-oxonaphthalene-2,7-disulfonate
21	3844-45-9	disodium;2-[[4-[ethyl-[(3-sulfonatophenyl)methyl]amino]phenyl]-[4-[ethyl-[(3-sulfonatophenyl)methyl]azaniumylidene]cyclohexa-2,5-dien-1-ylidene]methyl]benzenesulfonate
22	520-45-6	3-acetyl-6-methylpyran-2,4-dione
23	5850-16-8	Disodium 4,4'-[(2,4-dihydroxy-1,3-phenylene)bis(azo)]bisnaphthalene-1-sulphonate
24	17372-87-1	Disodium 2',4',5',7'-tetrabromo-3-oxo-3H-spiro[isobenzofuran-1,9'-xanthene]-3',6'-bis(olate) , Eosin Y disodium
25	4196-99-0	disodium 2-[(2Z)-2-(2-oxonaphthalen-1-ylidene)hydrazinyl]-5-[(4-sulfonatophenyl) diazenyl]benzenesulfonate
26	573-58-0	Disodium 3,3'-[[1,1'-biphenyl]-4,4'-diylbis(azo)]bis(4-aminonaphthalene-1-sulphonate)
27	633-96-5	sodium;4-[2-(2-oxonaphthalen-1-ylidene)hydrazinyl]benzenesulfonate
28	523-44-4	sodium;4-[(2E)-2-(4-oxonaphthalen-1-ylidene)hydrazinyl]benzenesulfonate
29	5413-75-2	disodium;7-hydroxy-8-[(4-phenyldiazenylphenyl)diazenyl]naphthalene-1,3-disulfonate
30	568-63-8	Sodium 2-(6-hydroxy-2,4,5,7-tetraiodo-3-oxo-3H-xanthen-9-yl)benzoate
31	12768-78-4	sodium 4-[[4-(diethylamino)phenyl]-(4-diethylazaniumylidenecyclohexa-2,5-dien-1-ylidene)methyl]naphthalene-2,7-disulfonate
32	3520-42-1	2-[3-(diethylamino)-6-diethylazaniumylidenexanthen-9-yl]-5-sulfobenzenesulfonate
33	547-58-0	4-((4-(Dimethylamino)phenyl)diazenyl)benzenesulfonic acid, sodium salt
34	7681-93-8	(1R,3S,5R,7R,8E,12R,14E,16E,18E,20E,22R,24S,25R,26S)-22-[(2R,3S,4S,5S,6R)-4-amino-3,5-dihydroxy-6-methyloxan-2-yl]oxy-1,3,26-trihydroxy-12-methyl-10-oxo-6,11,28-trioxatricyclo[22.3.1.05,7]octacosa-8,14,16,18,20-pentaene-25-carboxylic acid
35	1934-20-9	6-hydroxy-5-(phenylazo)-2-naphthalenesulfonic aci monosodium salt
36	587-98-4	sodium;3-[(4-anilinophenyl)diazenyl]benzenesulfonate
37	99-76-3	4-Hydroxybenzoic acid methylester
38	120-47-8	4-Hydroxybenzoic acid

39	94-13-3	4-Hydroxybenzoic acid, n-propyl ester
40	552-41-0	1-(2-hydroxy-4-methoxyphenyl)ethanone
41	94-26-8	4-Hydroxybenzoic acid n-butyl este
42	35354-74-6	2-(4-hydroxy-3-prop-2-enylphenyl)-4-prop-2-enylphenol
43	528-43-8	2-(2-hydroxy-5-prop-2-enylphenyl)-4-prop-2-enylphenol
44	81-88-9	[9-(2-carboxyphenyl)-6-(diethylamino)xanthen-3-ylidene]-diethylazanium;chloride
45	492-80-8	4,4'-carbonimidoylbis[N,N-dimethyl-Benzenamine

Table S2 Ionization status of each detected compound

Analyte compound No.	**Declustering Potential（DP）**	**Precursor ion (m/z)**	**Quantitative ion**		**Qualitative ion**		**Retention time（min）**
			Product ion (m/z)	**Collision Energy (CE)**	**Product ion (m/z)**	**Collision Energy (CE)**	
1	-60	191.03	110.98	-20	86.96	-20	1.64
2	-25	233.23	197.87	-18	116.90	-35	3.97
3	-40	271.53	171.95	-20	290.98	-20	4.00
4	-50	268.08	228.00	-20	221.02	-25	4.04
5	-40	268.13	206.02	-25	301.98	-15	4.21
6	-50	215.58	183.48	-22	287.05	-30	4.24
7	-80	210.03	292.36	-25	284.26	-30	4.30
8	-60	120.98	120.98	-5	77.00	-20	4.30
9	-40	203.13	170.95	-20	205.98	-30	4.33
10	-50	225.11	207.00	-22	199.99	-22	4.63
11	-50	156.03	179.95	-20	79.93	-40	4.49

Analyte compound No.	Declustering Potential （DP）	Precursor ion (m/z)	Quantitative ion		Qualitative ion		Retention time （min）
			Product ion (m/z)	Collision Energy (CE)	Product ion (m/z)	Collision Energy (CE)	
12	-73	231.50	179.00	-15	158.00	-20	4.59
13	-100	111.08	111.08	-5	67.00	-15	4.59
14	-70	289.07	245.15	-20	203.03	-30	4.68
15	-60	303.40	221.20	-20	205.96	-40	4.73
16	-100	293.08	155.91	-45	170.96	-30	4.68
17	-60	228.10	220.97	-20	170.00	-20	4.75
18	-80	381.47	169.96	-40	341.17	-25	4.76
19	-100	435.04	170.98	-30	235.99	-40	4.79
20	-100	435.11	355.05	-35	301.89	-40	4.79
21	-100	373.43	169.97	-40	333.26	-25	4.80
22	-50	166.95	82.96	-25	123.04	-15	4.84
23	-70	288.02	221.00	-20	206.15	-40	4.89
24	-100	646.80	520.83	-40	442.94	-50	4.91
25	-60	255.11	156.02	-40	143.06	-20	5.05
26	-80	325.15	151.96	-30	416.02	-20	5.06
27	-100	327.02	170.90	-40	156.00	-40	5.07
28	-100	328.03	170.97	-30	248.13	-30	5.07
29	-100	511.13	301.95	-40	79.96	-120	5.08
30	-130	834.83	662.76	-50	536.93	-50	5.13
31	-120	593.26	469.29	-65	513.31	-40	5.19
32	-50	557.32	513.15	-60	433.14	-65	5.31
33	-100	304.07	155.90	-40	289.06	-30	5.32
34	-50	664.25	439.18	-25	421.21	-25	5.34
35	-100	327.03	206.96	-40	180.91	-60	5.38
36	-100	352.05	155.95	-40	79.89	-40	5.61
37	-67	151.10	92.00	-25	135.99	-20	5.77
38	-70	165.00	92.00	-30	137.00	-20	6.14
39	-70	178.90	92.00	-30	137.00	-20	6.53
40	-60	164.91	149.94	-20	121.99	-40	6.69
41	-80	193.00	92.00	-35	136.00	-25	6.93
42	-100	265.18	223.09	-40	224.10	-40	7.36
43	-100	265.13	247.16	-40	245.11	-40	7.72
44	+70	443.09	399.00	+64	355.10	+84	7.23
45	+80	268.00	147.00	+40	107.00	+40	7.15

Table S3 Effect of three different filter membranes on the recovery rates of 45 pigments and preservatives

Analyte compound No.	PVDF （%）	PA （%）	PTFE （%）
1	106.0	106.0	106.0
2	123.0	113.0	125.0
3	114.0	93.0	114.0
4	105.0	70.0	108.0
5	94.0	22.0	98.0
6	98.0	105.0	98.0
7	91.0	89.0	86.0
8	104.0	106.0	100.0
9	100.0	101.0	102.0
10	93.0	111.0	96.0
11	92.0	96.0	102.0
12	102.0	99.0	101.0
13	102.0	101.0	102.0
14	95.0	111.0	98.0
15	96.0	85.0	97.0
16	85.0	82.0	97.0
17	101.0	121.0	109.0
18	103.0	105.0	101.0
19	95.0	94.0	95.0
20	93.0	92.0	99.0
21	98.0	102.0	103.0
22	106.0	112.0	105.0
23	93.0	92.0	99.0
24	102.0	146.0	104.0
25	97.0	113.0	106.0
26	85.0	4.1	97.0
27	97.1	84.0	102.1
28	97.0	85.0	101.2
29	90.0	63.0	97.0
30	94.0	101.0	111.0
31	98.0	98.0	103.0
32	97.0	96.0	100.0
33	89.0	102.0	102.0
34	102.0	104.1	102.0
35	77.0	78.2	91.0
36	59.2	77.0	93.0
37	131.0	93.8	103.0
38	136.0	96.7	98.0
39	105.0	90.0	91.2

Analyte compound No.	PVDF （%）	PA （%）	PTFE （%）
40	1.0	97.0	100.4
41	1.0	91.0	91.0
42	1.0	95.9	97.5
43	1.0	95.0	95.0
44	1.0	103.0	102.0
45	1.0	110.0	109.0