RapidVap N2 System for Evaporation per EPA Method 8270

Principle

US EPA Method 8270 is used to determine the concentration of semivolatile organic compounds in extracts from soils, air and water samples. This application note uses Labconco's RapidVap N2 Evaporation System for the evaporation step of this method.

Equipment

- RapidVap N2 Evaporation System (7910000) with 600 ml block (7494500)
- 600 ml glassware with 1.5 ml end point (7913900)
- Glassware caps (7925500)
- Methylene Chloride
- 8270 LCS Target Compounds
- Agilent 6890 Series GC with 5973 MSD

Procedure

Evaporation tubes were filled with 300 ml of methylene chloride spiked with 100 µg/l of LCS target compounds.

RapidVap Conditions:

Block Preheat and Temperature: 40° C

Nitrogen Pressure: 10 psi

Vortex Speed: 70%

Time Required: 90 minutes

Results

Test Sample #	#1 1487B Conc.†	#2 1488B Conc.†	Average Conc.†	% RSD*
N-Nitrosodimethyl amine Pyridine	75.82	69.42	77.18	11.0
2-Picoline	72.94	66.61	74.94	12.7
2-Fluorophenol	73.65	67.44	72.84	6.9
Aniline	79.89	74.10	80.22	7.8
Phenol-d5	51.25	51.68	56.33	15.0
Phenol	86.65	81.01	42.53	4.1
bis(2-Chloroethyl)ether	87.28	83.53	87.96	5.5
2-Chlorophenol-d4	86.52	81.13	85.27	4.3
2-Chlorophenol	85.98	81.91	87.82	8.0
1,3-Dichlorobenzene	79.52	75.24	82.76	11.6
1,4-Dichlorobenzene	80.36	76.42	83.61	11.1
1,2-Dichlorobenzene-d4	82.25	78.80	83.67	6.8
1,2-Dichlorobenzene	80.34	76.05	82.62	9.6
Benzyl alcohol	86.79	83.81	88.11	5.8
2-Methylphenol	78.13	74.90	78.77	5.4
bis(2-chloroisopropyl)ether	80.73	75.51	80.86	6.7
Acetophenone	87.85	84.79	88.59	4.8
n-Nitroso-di-n-propylamine	78.37	76.24	78.53	3.0
4-Methylphenol	76.40	74.92	76.81	2.8
Hexachloroethane	78.15	74.48	81.51	11.3
Nitrobenzene-d5	89.32	83.37	88.42	5.3
Nitrobenzene	87.96	81.71	88.71	8.4
Isophorone	90.05	87.72	90.79	3.8
2-Nitrophenol	90.05	84.80	90.87	7.2
2,4-Dimethylphenol	84.44	81.60	79.04	8.9
bis(2-Chloroethoxy)methane	84.05	79.71	84.63	6.2
2,4-Dichlorophenol	87.25	85.52	88.73	4.7
Benzoic acid	93.80	97.85	95.40	2.3
1,2,4-Trichlorobenzene	85.99	79.79	87.25	9.4
Naphthalene	87.96	82.69	88.80	7.4
4-Chloroaniline	63.23	65.69	69.61	12.9
Toluenediamine	84.49	74.49	84.03	11.1
Hexachlorobutadiene	84.63	78.01	86.10	10.4
4-Chloro-3-methylphenol	113.62	117.26	115.67	1.6
2-Methylnaphthalene	95.36	93.01	96.39	4.1
Hexachlorocyclopentadiene	62.12	54.25	59.73	8.0
1,2,4,5-Tetrachlorobenzene	87.41	79.20	86.86	8.5

Test Sample #	#1 1487B Conc.†	#2 1488B Conc.†	Average Conc.†	% RSD*
2,4,6-Trichlorophenol	93.99	91.68	94.49	3.3
2,4,5-Trichlorophenol	88.74	84.06	88.31	4.6
2-Fluorobiphenyl	88.46	82.25	86.59	4.4
2-Chloronaphthalene	103.31	98.85	103.68	4.9
2-Nitroaniline	92.78	89.64	92.98	3.7
Dimethylphthalate	85.92	82.23	85.09	3.0
1,3-Dinitrobenzene	95.18	91.42	94.83	3.4
2,6-Dinitrotoluene	92.71	93.88	93.88	1.3
Acenaphthylene	86.66	81.60	85.98	4.7
3-Nitroaniline	85.35	83.01	89.62	10.6
Acenaphthene	90.49	85.39	89.90	4.7
2,4-Dinitrophenol	85.32	85.13	86.80	3.1
4-Nitrophenol	89.66	81.82	89.21	8.0
Dibenzofuran	91.48	86.90	91.04	4.3
2,4-Dinitrotoluene	92.87	88.66	92.22	3.6
2,3,4,6-Tetrachlorophenol	92.84	90.83	93.26	2.9
Diethylphthalate	87.49	84.14	86.78	2.7
Fluorene	89.14	85.09	88.50	3.5
4-Chlorophenyl-phenylether	86.55	82.64	86.15	3.9
4-Nitroaniline	73.90	66.81	77.16	15.9
4,6-Dinitro-2-methylphenol	97.30	92.20	96.17	3.7
n-Nitrosodiphenylamine (200)	203.14	195.21	199.55	2.0
2,4,6-Tribromophenol	96.40	92.46	91.93	5.2
Azobenzene	111.81	108.73	110.64	1.5
alpha-BHC	94.08	91.63	93.15	1.4
4-Bromophenyl-phenylether	95.29	93.02	94.32	1.2
Hexachlorobenzene	94.44	91.49	93.19	1.6
beta-BHC	84.91	75.84	82.03	6.5
Pentachlorophenol	88.17	85.68	90.00	6.1
gamma-BHC	90.93	84.37	88.37	4.0
Phenanthrene	97.18	91.48	94.54	3.0
Anthracene	91.29	84.57	89.22	4.5
delta-BHC	81.74	72.91	79.06	6.8
Carbazole	81.44	72.52	79.48	7.8
Heptachlor	95.01	90.76	93.41	2.5
Di-n-butylphthalate	86.09	77.05	82.89	6.1
Aldrin	227.90	215.12	223.38	3.2
Heptachlor epoxide	84.16	75.93	81.72	6.2

Test Sample #	#1 1487B Conc.†	#2 1488B Conc.†	Average Conc.†	% RSD*
Fluoranthene	77.79	68.18	75.73	8.9
Benzidine	0.00	0.00	1.04	173.2
Pyrene	107.29	89.85	95.17	11.1
alpha-Endosulfan	110.66	93.60	97.99	11.4
p,p'-DDE	111.30	92.58	98.05	11.8
Terphenyl-d14	107.20	90.00	93.90	12.6
Dieldrin	77.32	64.29	68.11	11.8
Endrin	101.95	85.81	90.57	10.9
Endrin aldehyde	98.66	80.07	86.83	11.8
beta-Endosulfan	91.90	79.72	84.06	8.1
p,p'-DDD	92.49	80.44	84.78	7.9
Butylbenzylphthalate	90.34	79.40	83.91	6.8
Endosulfan sulfate	81.92	69.22	77.11	8.9
p,p'-DDT	93.71	80.38	85.79	8.2
Methoxychlor	91.48	84.46	87.85	4.0
Benzo[a]anthracene	94.05	86.90	90.27	4.0
3,3'-Dichlorobenzidine	66.58	77.46	87.06	30.6
Chrysene	103.15	95.86	99.61	3.7
bis(2-Ethylhexyl)phthalate	91.62	80.17	85.05	6.9
Di-n-octylphthalate	84.42	75.28	80.02	5.7
Benzo[b]fluoranthene	95.86	87.91	93.21	4.9
Benzo[k]fluoranthene	100.56	93.09	93.09	5.0
Benzo[a]pyrene	109.81	101.59	101.59	4.0
Indeno[1,2,3-cd]pyrene	90.25	81.00	88.94	8.3
Dibenz[a,h]anthracene	91.21	82.05	89.59	7.7
Benzo[g,h,i]perylene	88.63	79.46	87.47	8.6

*RSD % = relative standard deviation

†Conc. = actual concentrations in µg/L. Since the standards used were 100 µg/L, the concentration values are equivalent to % recovery from the expected standard concentration value.

Testing was conducted by Heritage Environmental Services, Indianapolis, Indiana

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