

# RapidVap N2 System for Evaporation per EPA Method 8081

## Principle

US EPA Method 8081 is used to determine the concentration of various organochlorine pesticides in extracts from solid and liquid matrices. \*This application note uses Labconco's RapidVap N2 system for the evaporation step of this method.

<https://www.epa.gov/sites/default/files/2015-12/documents/8081b.pdf>

## 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
- Semivolatile Organic Pesticides
- Agilent 6890 GC with ECD detector



## Procedure

Evaporation tubes were filled with 200 ml of methylene chloride spiked with varying concentrations  $\mu\text{g/l}$  of target compounds semivolatile organic pesticides (see table below).

RapidVap Conditions:

Block Preheat and Temperature 60° C

Nitrogen Pressure: 80 psi

Vortex Speed: 60%

Time required: 75 minutes

The samples were evaporated to an end point of approximately 5 ml on the RapidVap.

After reaching an end point below 5ml the sample extract was transferred to a 5 ml volumetric flask. The concentrator glassware was rinsed down several times with methylene chloride during the sample transfer. The sample extract was then brought to a final 5 ml volume. Analysis was done on the Agilent 6890 GC with ECD detector. The column used was a Restek CLP-1.

## Results

Percent Recoveries	Trials				Standard Deviation
	1	2	3	4	
Alpha-bhc	105.1%	104.0%	107.5%	95.0%	5.4%
Gamma-bhc (Lindane)	103.4%	103.1%	106.2%	92.9%	5.8%
Beta-BHC	100.4%	98.9%	103.5%	91.0%	5.3%
Heotachlor	100.3%	100.5%	101.1%	88.7%	5.9%
Delta-BHC	108.3%	105.3%	109.1%	97.1%	5.5%
Aldrin	96.7%	97.1%	100.7%	89.6%	4.6%
Heptachlor Epoxide	100.8%	101.0%	104.7%	92.5%	5.2%
Alpha-Chlordane	103.7%	104.7%	109.1%	96.2%	5.3%
Gamma-Chlordane	95.6%	97.0%	101.2%	89.3%	4.9%
Endosulfan I	103.7%	104.7%	109.1%	96.2%	5.3%
4,4'-DDE	100.5%	100.9%	106.1%	94.6%	4.7%
Dieldrin	103.0%	102.8%	107.0%	94.8%	5.1%
Endrin	115.0%	110.8%	114.6%	99.9%	7.1%
4,4'-DDD	116.2%	114.5%	120.9%	106.4%	6.0%
Endosulfan II	104.2%	103.3%	107.7%	95.3%	5.2%
4,4'-DDT	82.8%	82.3%	82.3%	74.3%	4.1%
Endrin Aldehyde	99.4%	99.4%	104.2%	93.2%	4.5%
Endosulfan Sulfate	101.2%	99.6%	104.5%	92.7%	5.0%
Methoxychlor	97.8%	94.3%	93.4%	83.6%	6.1%
Endrin Ketone	100.9%	99.6%	103.7%	91.7%	5.1%
DCB (Surrogate)	93.2%	92.6%	92.2%	85.3%	

Following is a table with the concentrations and recoveries for the data.

	Spike Conc. (µg/L)	Recovered Concentration (µg/L)				% Recovery				Std. Dev. of % Rec.
Alpha-BHC	0.04	0.042	0.044	0.047	0.045	105.10%	104.00%	107.50%	95.00%	5.5
Gamma-BHC (Lin)	0.04	0.041	0.043	0.045	0.042	103.40%	103.10%	106.20%	92.90%	5.8
Beta-BHC	0.04	0.04	0.04	0.041	0.037	100.40%	98.90%	103.50%	91.00%	5.3
Heotachlor	0.04	0.04	0.04	0.041	0.036	100.30%	100.50%	101.10%	88.70%	6
Delta-BHC	0.04	0.04	0.046	0.05	0.048	108.30%	105.30%	109.10%	97.10%	5.5
Aldrin	0.04	0.039	0.038	0.038	0.034	96.70%	97.10%	100.70%	89.60%	4.6
Heptachlor Epoxide	0.04	0.04	0.041	0.043	0.039	100.80%	101.00%	104.70%	92.50%	5.2
Alpha-Chlordane	0.04	0.041	0.043	0.047	0.046	103.70%	104.70%	109.10%	96.20%	5.4
Gamma-Chlordane	0.04	0.038	0.037	0.038	0.034	95.60%	97.00%	101.20%	89.30%	4.9
Endosulfan I	0.04	0.041	0.043	0.047	0.046	103.70%	104.70%	109.10%	96.20%	5.4
4,4'-DDE	0.04	0.04	0.041	0.043	0.041	100.50%	100.90%	106.10%	94.60%	4.7
Dieldrin	0.08	0.082	0.085	0.091	0.086	103.00%	102.80%	107.00%	94.80%	5.1
Endrin	0.08	0.092	0.102	0.117	0.117	115.00%	110.80%	114.60%	99.90%	7
4,4'-DDD	0.08	0.093	0.106	0.129	0.137	116.20%	114.50%	120.90%	106.40%	6
Endosulfan II	0.08	0.083	0.086	0.093	0.088	104.20%	103.30%	107.70%	95.30%	5.2
4,4'-DDT	0.08	0.066	0.055	0.045	0.033	82.80%	82.30%	82.30%	74.30%	4.1
Endrin Aldehyde	0.08	0.08	0.079	0.082	0.077	99.40%	99.40%	104.20%	93.20%	4.5
Endosulfan Sulfate	0.08	0.081	0.081	0.084	0.078	101.20%	99.60%	104.50%	92.70%	5
Methoxychlor	0.1	0.098	0.092	0.086	0.072	97.80%	94.30%	93.40%	83.60%	6.1
Endrin Ketone	0.08	0.081	0.08	0.083	0.076	100.90%	99.60%	103.70%	91.70%	5.1
DCB (Surrogate)	0.1	0.093	0.086	0.08	0.068	93.20%	92.60%	92.20%	85.30%	3.7

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