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VOC Monitoring in Wisconsin - Which Analytes are Required?

Many of the DNR's regulatory programs require monitoring for volatile organic compounds (VOCs). There are literally hundreds of VOCs. To assist laboratories, the Laboratory Certification Program has put together the following list of commonly requested volatile organics based on shared lab methods. A laboratory could routinely monitor for these 69 VOCs when using purge and trap (*i.e.*, EPA SW-846 Method 5030)* with GC/MS (8260; EPA Method 524 or 624) and cover most DNR programs for compliance monitoring. The 69 "common" VOCs are:

CAS	Chemical	CAS	Chemical
67-64-1	Acetone	594-20-7	2,2-Dichloropropane
71-43-2	Benzene	542-75-6	1,3-Dichloropropene (cis+trans)
108-86-1	Bromobenzene	563-58-6	1,1-Dichloropropylene
74-97-5	Bromodichloromethane	100-41-4	Ethylbenzene
75-25-2	Bromoform	87-68-3	Hexachlorobutadiene
74-83-9	Bromomethane	110-54-3	Hexane
75-65-0	Tertiary butyl alcohol	98-82-8	Isopropylbenzene
104-51-8	n-Butylbenzene	108-20-3	Di-isopropyl ether
135-98-8	sec-Butylbenzene	99-87-6	p-Isopropyltoluene
98-06-6	tert-Butylbenzene	78-93-3	Methyl ethyl ketone (MEK)
75-15-0	Carbon Disulfide	108-10-1	Methyl isobutyl ketone (MIBK)
56-23-5	Carbon Tetrachloride	1634-04-4	Methyl tert-butyl ether (MTBE)
108-90-7	Chlorobenzene	75-09-2	Methylene Chloride
75-00-3	Chloroethane	91-20-3	Naphthalene
67-66-3	Chloroform	103-65-1	n-Propylbenzene
74-87-3	Chloromethane (Methyl chloride)	100-42-5	Styrene
95-49-8	2-Chlorotoluene	630-20-6	1,1,1,2-Tetrachloroethane
106-43-4	4-Chlorotoluene	79-34--5	1,1,2,2-Tetrachloroethane
124-48-1	Dibromochloromethane	127-18-4	Tetrachloroethylene
96-12-8	Dibromochloropropane [DBCP]	109-99-9	Tetrahydrofuran
106-93-4	1,2-Dibromoethane [EDB]	108-88-3	Toluene
74-95-3	Dibromomethane	87-61-6	1,2,3-Trichlorobenzene
95-50-1	1,2-Dichlorobenzene	120-82-1	1,2,4-Trichlorobenzene
541-73-1	1,3-Dichlorobenzene	79-01-6	Trichloroethene [TCE]
106-46-7	1,4-Dichlorobenzene	71-55-6	1,1,1-Trichloroethane
75-71-8	Dichlorodifluoromethane (Freon 12)	79-00-5	1,1,2-Trichloroethane
75-35-4	1,1-Dichloroethene	75-69-4	Trichlorofluoromethane (Freon 11)
156-59-2	cis-1,2Dichloroethene	96-18-4	1,2,3-Trichloropropane
156-60-5	trans-1,2-Dichloroethene	95-63-6	1,2,4-Trimethylbenzene
75-34-3	1,1-Dichloroethane	108-67-8	1,3,5-Trimethylbenzene
107-06-2	1,2-Dichloroethane	76-13-1	1,1,2-Trichloro 1,2,2-trifluoroethane
78-87-5	1,2-Dichloropropane	75-01-4	Vinyl Chloride
142-28-9	1,3-Dichloropropane	1330-20-7	Xylenes, Total

An additional 20 VOCs are covered by the solid waste assessment monitoring, wastewater permit application, and hazardous waste groundwater monitoring. These VOCs include:

CAS	Chemical
75-05-8	Acetonitrile
107-02-8	Acrolein
107-13-1	Acrylonitrile
107-05-1	Allyl Chloride
74-97-5	Bromochloromethane
126-99-8	Chloroprene
110-57-6	Trans-1,4-Dichloro-2-butene
78-88-6	2,3-Dichloropropene
123-91-1	1,4-Dioxane
97-63-2	Ethyl Methacrylate
591-78-6	Methyl butyl ketone
78-83-1	Isobutyl Alcohol
126-98-7	Methacrylonitrile
74-88-4	Methyl iodide
80-62-6	Methyl methacrylate
924-16-3	N-Nitroso-di-n-butylamine
98-95-3	Nitrobenzene
109-06-8	2-Picoline
95-53-4	o-Toluidine
108-05-4	Vinyl Acetate

* Purge and trap method is one of several VOC preparation methods for liquid and solid samples. It involves the addition of water for low-level sample or solvent (like methanol) for high-level sample. Other sample prep methods include: solvent (e.g., hexane) addition; heating sample for headspace analysis; and distillation. These other prep methods may have advantage over P/T for certain VOCs. For example, azeotrophic distillation will have a distillate with more-water soluble VOCs (like TBA and 1,4-dioxane), so analysis of the distillate will provide for better detection of these VOCs.