

ANALYSIS OF WATER AND AIR FOR COMPOUNDS LISTED BY THE
MICHIGAN DEPARTMENT OF NATURAL RESOURCES

The following information has been compiled as a result of a communication from the Michigan Department of Natural Resources which listed a number of chemical compounds. The information gathered is presented in sections which discuss the availability of standards and the status of methods for water and air.

Standards

Except for heptachlorostyrene and the penta- and hexachlorodibenzofurans the compounds on the list are available at Dow for use as reference compounds in analytical methods and procedures. The two pentachlorodibenzofurans and 2,3,4,6,7,8-hexachlorodibenzofuran are available at Dow in amounts less than can be weighed, but these compounds can be used in establishing gas and liquid chromatography retention times and in measuring recovery from samples.

(The isomer identity of these furans has not been absolutely proven.)

Because all the isomers of pentachlorodibenzo-p-dioxin and penta- and hexachlorodibenzofuran are not available in or out of Dow, analysis for small amounts of these compounds cannot be isomer specific. Thus, the absence of an isomer can be proven but if an apparent response for the isomer is detected, the identity of the isomer cannot be proven.

Water

EPA procedures with minor variations have been validated by Dow using Millipore water for all compounds listed except the dioxins, furans, Aroclor 1260, 3-chlorobiphenyl, heptachlorostyrene, and 2,4-dinitrophenol. Detection limits of these procedures ranged from 0.5 to 50 ppb. These validated procedures should be applicable to the determination of Aroclor 1260, 3-chlorobiphenyl and heptachlorostyrene.

The EPA procedure for 2,3,7,8-tetrachlorodibenzo-p-dioxin in wastewater has also been validated. The limit of detection of this procedure is two parts per trillion. The same procedure should be applicable to determining the absence of the other listed dioxins and furans in wastewater. Determining

the specific isomers of penta- and hexa-dioxins and furans requires that all isomers of a compound be available along with an isomer specific procedure.

Air

Validated methods using solid absorbents are available at Dow for chloro-phenols, acrylonitrile, ethylene oxide, diphenyl oxide, methylene chloride, benzene, chlorobenzenes, vinyl chloride, formaldehyde and perchloroethylene. The methods have been validated to one-tenth of the exposure guideline (American Conference of Governmental Industrial Hygienists TLV, Dow Industrial Hygiene Guideline or an estimated guideline where one has not been set). The lower limit of these validations range from 0.0001 to 15 ppm (v/v) depending on the exposure guideline.

The procedure used to determine dioxins and furans in air (collection of particulates from air and analysis of the particulates) has not been validated. Written directions for carrying out the sampling and analysis are available within Dow. This procedure for analysis of air assumes that the dioxins are on particulates in the air. As above, results for pentachloro-dibenzo-p-dioxin and tetra-, penta- and hexachlorodibenzofuran cannot be isomer specific until all isomers of each compound are available.

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