

## Gas Chromatography

### Applications for Process and Laboratory

#### Monitoring of Chlorinated Hydrocarbons in Water

Water is used in various processes for contact or non-contact cooling medium, as solvent or clean up medium or as clean water in food processing facilities.

It has to be cleaned up before being discharged back into the environment again or prior usage. The clean up process has to be continuously monitored to ensure necessary or mandated levels of threshold concentrations that are typically in the ppb or even in the ppt range. When utilizing an on line Process GC system, these low concentration levels can not be detected in a reliable manner without using some kind of sensitivity enhancement. The most elegant procedure is using a liquid/gas extraction in the form of a

continuous on line sparging or membrane extraction method. In either case, volatile constituents are transferred from the liquid into the gas phase. Using these types of extraction methods also provides a relative enrichment of the volatile constituents in the gas phase compared to their concentration in the liquid phase.

Additionally, by utilizing highly specific process suitable detectors, additional gain in sensitivity can be ensured. The following example is utilizing a sparging system, a "valveless" capillary column separation system and an Electron Capture Detector to monitor on line and automatically halogenated hydrocarbons.

**Analytical System:**

**GC:** PGC x02, MAXUM

**Injection:**

Vapor

**Columns:**

Capillary Columns

**Column Switching:**

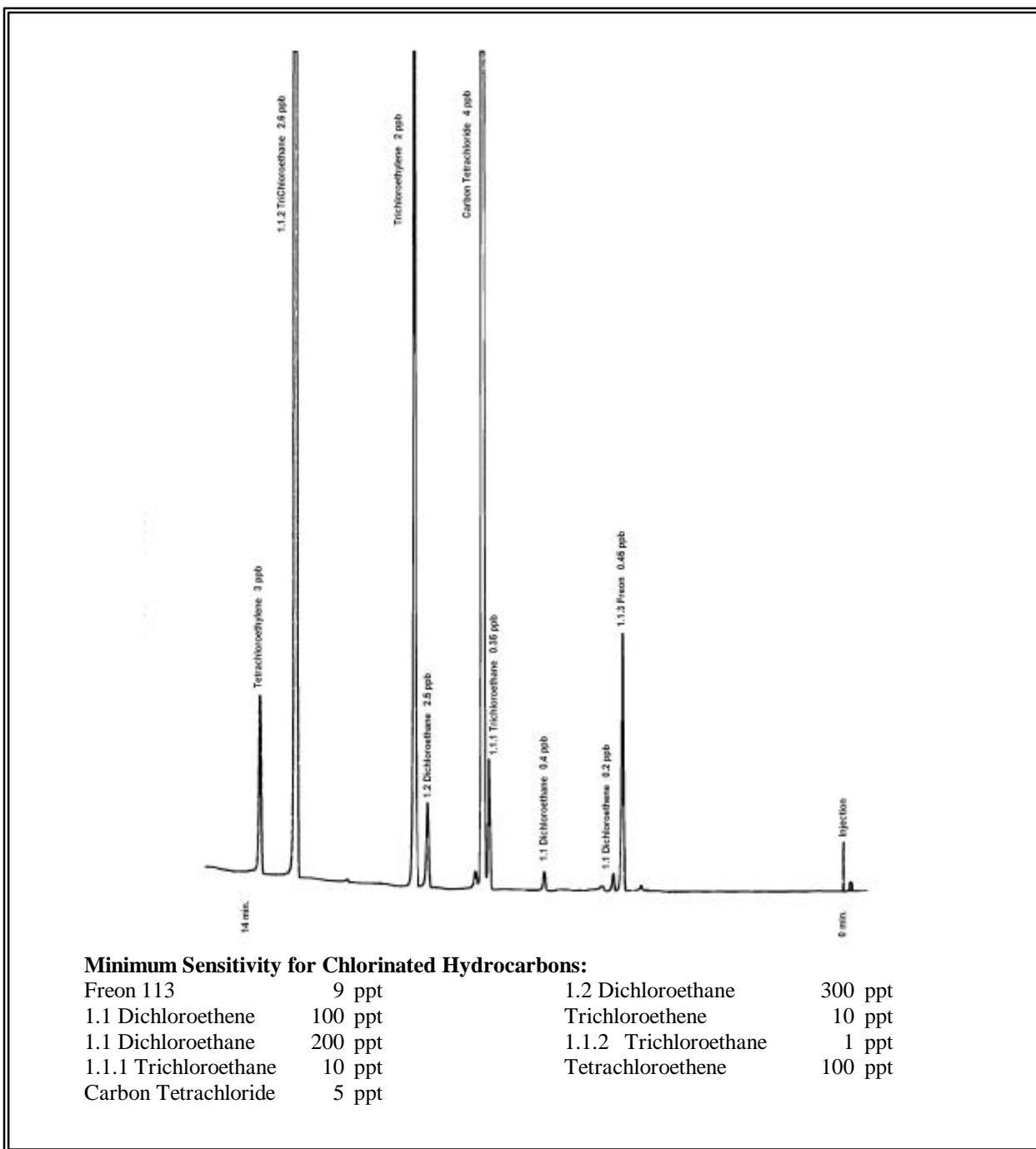
Valveless "LIVE"  
Column Switching

**Detector:**

Electron Capture  
Detector

**Specialty:**

ppt sensitivity,  
Electron Capture  
Detector



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