CHROMTECH eTRAP

VOC Analytics with Headspace and eTrap

Electric focusing of highly volatile organic compounds without cryogenic cooling media

RESULTS

The documented chromatogram shows the separation of 17 halogenated, readily volatile compounds after a five-minute headspace enrichment with eTrap.

Purpose and measurement principle

In the case of a splitless headspace injection, readily volatile connections can only be focused to a limited extent at the column head. The CHROMTECH eTrap therefore enriches the analytes in a deactivated 1/16-inch stainless steel capillary before chromatographic separation. For highly volatile materials, the capillary is filled with Tenax TA 60/80 as standard.

After enrichment, the trap is heated electrically and with a low thermal mass. Rapid desorption transfers the collected substances into the GC system as a narrow sample band. This supports narrow peaks and a high detection sensitivity.

Product characteristics

- Two-stage Peltier cold trap with electric operation
- No liquid nitrogen and no liquid carbon dioxide required
- eTrap standard: cooling to about 20 Kelvin below ambient temperature
- eTrap Plus with suitable additional cooling: about 50 Kelvin below ambient temperature
- Rapid resistive heating up to 320 degrees Celsius
- Assembly outside the GC furnace; hence low influence of high furnace temperatures
- Other adsorbents are possible for different substances on request

Typical applications

eTrap and eTrap Plus support in particular splitless headspace injection, solid-phase dynamic extraction (SPDE), solid-phase microextraction (SPME), thermal desorption and purge-and-trap methods. For Agilent GC/MS systems, the controller can be integrated into MassHunter; for other systems, an independent controller is available.

The concrete design of the adsorbent, enrichment time, desorption and GC method depends on the substance range, the sample matrix and the existing device environment.

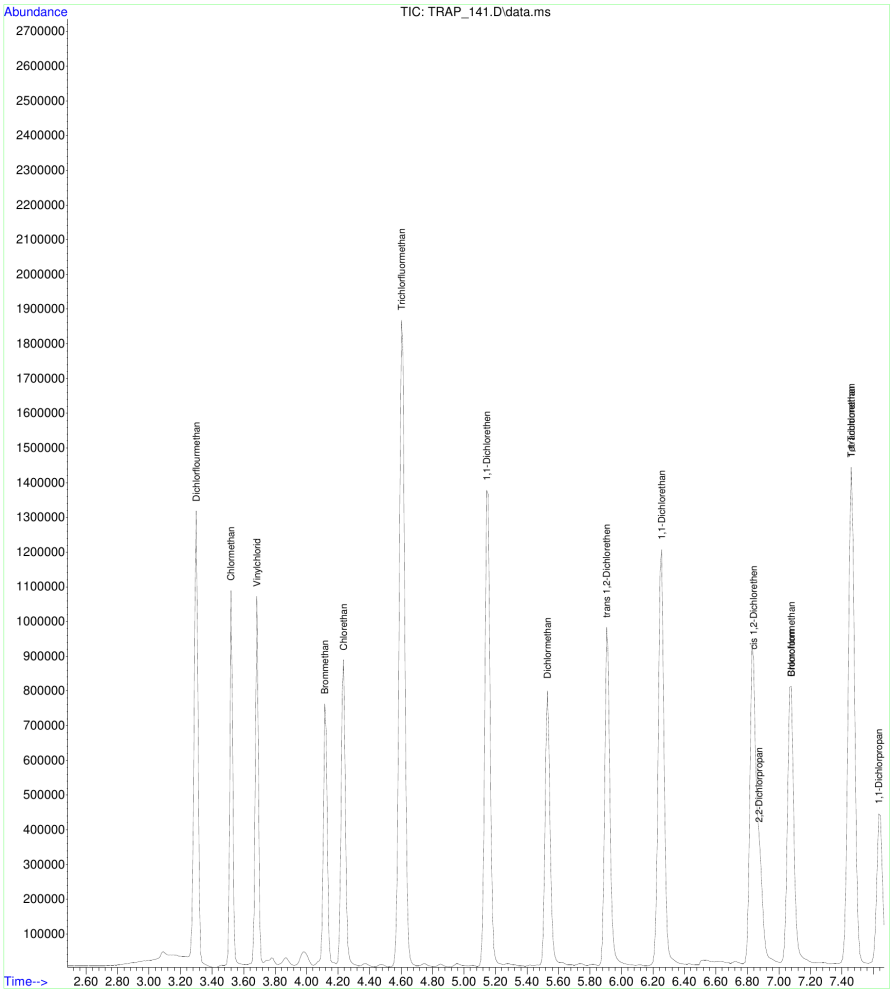
Chromatogram-described compounds

No Signal mapping No. Signal allocation		
1-dichlorofluoromethane 10 1,1-dichloroethane		
2 Chloromethane 11 cis-1,2-dichloroethene		
3 Vinyl chloride 12 2,2-dichloropropane		
4 Bromomethane 13 chloroform		
5 Chlorethane 14 Bromochloromethane		
6 Trichlorofluoromethane 15 Tetrachloromethane		
7 1,1-dichloroethene 16 1,1-trichloroethane		
8 Dichloromethane 17 1,1-dichloropropane		
9 trans-1,2-dichloroethene		

MEASURING EXAMPLE

VOC chromatogram

Typical TIC of a VOC standard after headspace enrichment with CHROMTECH Evolution GC-MSMS



Typical TIC of a VOC standard.

Details

Value from the original chromatogram	
Instrument	Evolution GC-MSMS
Reception method	VOCs with HS and Trap SIM.M
Sample name	100 µg/l · 5 min
Measurement time	6. December 2013 · 16:49
Sample vessel	Vial 33
Data set	TRAP_141.D

Classification

The measurement documents the focusing and chromatographic separation of a group of highly volatile halogenated compounds after a five-minute headspace enrichment. The figure is an application example and not a complete method validation report.