

Headspace Sampler

HS-10



Cost-Efficient Model Equipped with the Functions Needed for Headspace Analysis

The HS-10 headspace sampler is highly cost efficient, yet is equipped with advanced features such as a mixing function and the ability to heat-ahead the sample vials waiting for analysis.

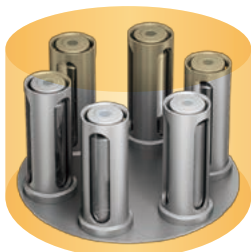
This instrument is the perfect platform for the analysis of residual pharmaceutical solvents and trace VOCs in wastewater.



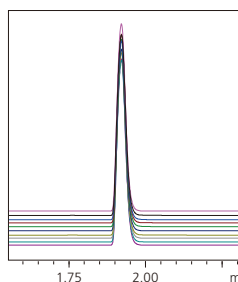
Features

1. Outstanding Reproducibility

Favorable area reproducibility can be obtained, thanks to high-accuracy flow rate control by electronic flow controllers (AFC and APC), and a thermostatic vial chamber with a uniform temperature distribution.



The temperature in the thermostatic vial chamber is uniform; as a result, there is no variance in gas-liquid equilibrium depending on intake position.



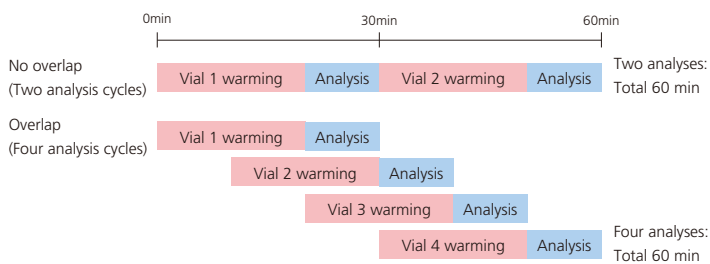
Reproducibility for 0.4 % Ethanol 2.0 % (n = 10)

2. Overlap Analysis

During a GC analysis, the HS-10 will take the next vial and move it to the vial heater. There, it can incubate for a specified time and be ready for injection when the previous analysis cycle has ended.



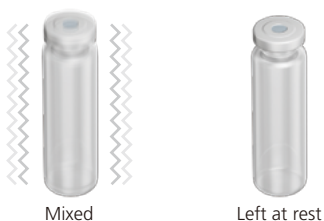
Capable of new vial intake even while other vials are being warmed.



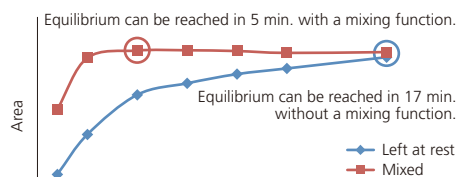
Difference in Analysis Times With and Without Overlap

3. Mixing Function

The HS-10 is equipped with the ability to mix each vial by shaking. This allows the headspace concentration within each sample to come to equilibrium sooner, ultimately saving time and increasing throughput.



Vials are mixed by moving them up and down.

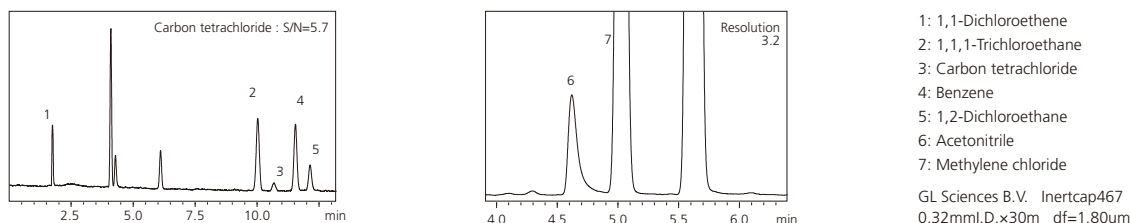


Relationship Between Warming Times and Area Values With and Without Mixing

Applications

1. USP <467> Analysis of Residual Pharmaceutical Solvent

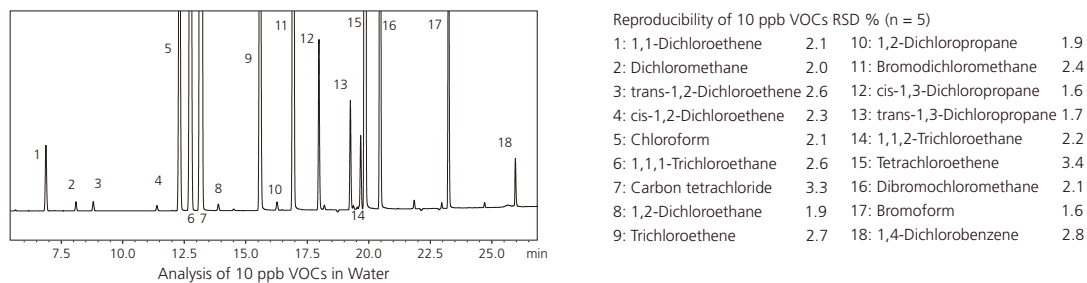
Residual solvents in pharmaceuticals are strictly controlled, and are categorized as Class 1 to Class 3 depending on the risk they pose to human health. The headspace GC method prescribed in USP <467> is utilized for the analysis of residual solvents. Class 1 Procedure A requires a S/N ratio ≥ 5 for 1,1,1-trichloroethane and a S/N ratio ≥ 3 for all peaks, while Class 2A requires a resolution ≥ 1.0 for acetonitrile and methylene chloride. The HS-10 satisfies all of these requirements.



Class 1 Procedure A: Analysis of an Aqueous Solution Class 2A Procedure A: Separation of Acetonitrile and Methylene Chloride

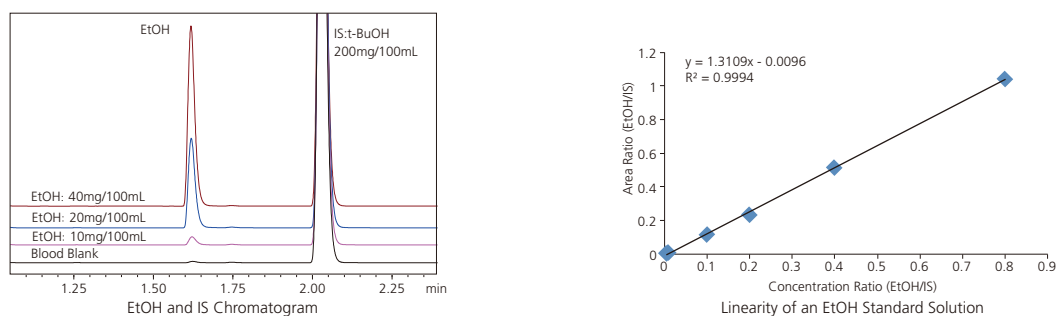
2. Analysis of VOCs in Water

This is an example of the analysis of 10 µg/L (10 ppb) VOCs in water using the HS-10 and an ECD. The VOCs in water can be measured with excellent reproducibility due to the high thermal stability of the HS-10.



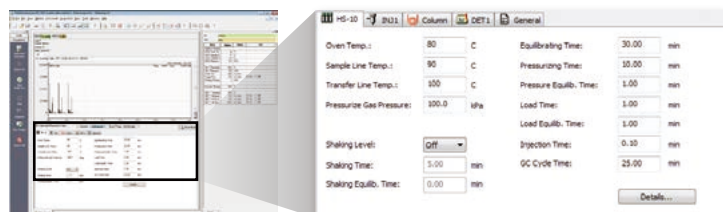
3. Blood Alcohol Concentration (BAC)

The analysis of alcohols in blood is frequently performed in the fields of forensic medicine and emergency medicine. It is utilized to determine the level of drunkenness from alcohol ingestion, to evaluate criminality, and to distinguish alcohol ingestion from other medical cases. These measurements must be performed quickly and with high accuracy, demands that can be met by headspace GC.



Compatible with the LabSolutions Comprehensive Workstation

LabSolutions LC/GC software integrates the conventional programs LcSolution and GcSolution. With a user control function and an audit trail function for method parameters, LabSolutions can accommodate a variety of regulations, including directives related to FDA 21 CFR Part 11.



Method Parameter Settings

HS-10 Specifications

Instrument Specifications Item	Details
Sample Injection Method	Inactivated sample loop 1 mL (standard), 0.5 mL, 2 mL (option)
Number of Vials	20
Vial Mixing	3 stages max.
Vial Warming Temperature	Room temp. +10 to 225°C (Setting: 35 to 225°C)
Sample Line Temperature	Room temp. +10 to 225°C (Setting: 35 to 225°C)
Transfer Line Temperature	Room temp. +10 to 225°C (Setting: 35 to 225°C)
Carrier Gas Control	Electronic control via AFC built into GC
Vial Pressurized-Gas Control	Electronic control via APC built into GC
Control Software	Operates collectively with LabSolutions LC/GC (FDA CFR 21 Part 11 compliant)
Power Supply	1400 VA max.
Dimensions	W407 × D527 × H455 mm
Weight	35 kg
Applicable Models	GC-2010/GC-2010 Plus, GC-2014



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