LT022

GL Sciences Inc.

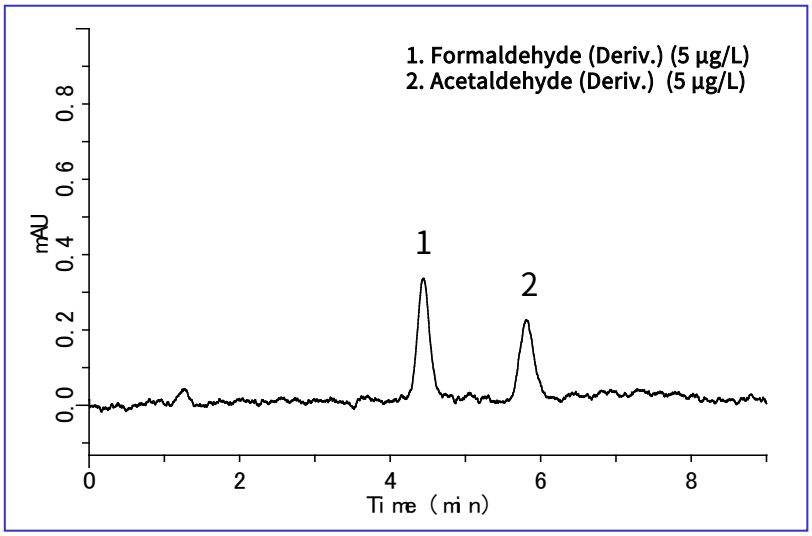
Introduction to an Aldehyde Analyzer

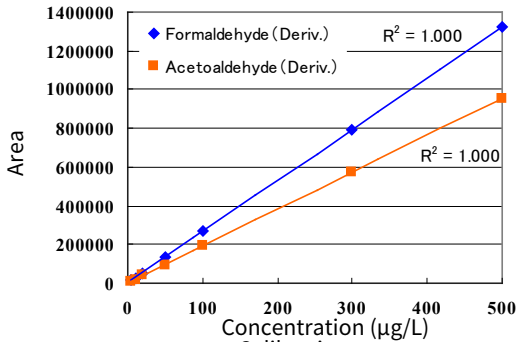
Aldehydes are a widely recognized as hazardous pollutants in both the atmosphere and building interiors. This report introduces the methods of analysis for formaldehyde and acetaldehyde, which are two of the most commonly analyzed aldehydes. A High Performance Liquid Chromatography (HPLC) was used as an analyzer.

Aldehydes were collected using the "sampling bag method," which is used mainly for VOC measurement in automotive interior materials.

As a pretreatment, the sample is placed in a Tedlar bag and heated for a period of time to release the aldehydes. The gas is then suctioned out with a sampling pump and collected on a DNPH cartridge. Acetonitrile is passed through the DNPH collection cartridges to elute the aldehydes. The recovered eluent is analyzed by HPLC to detect the aldehydes.

Example: Measurement of standard solution





Calibration curve

HPLC conditions

Column	: Inertsil ODS-80 A (5 µm, 150 x 4.6 mm I.D.)
Eluent	: A) CH_3CN B) H_2O A/B = 55/45, v/v(gradient mixer)
Flow rate	: 1.0 mL/min
Column temperature	: 40 ˚C
Detected	: UV 360 nm
Injection volume	: 20 µL

Measurement example

Sample pretreatment example

Sample

- Place the sample piece in a Tedlar-bag.
- Include a fixed amount of nitrogen gas

Heating

-At -60 ˚C to 65 ˚C and heated for 2 h.

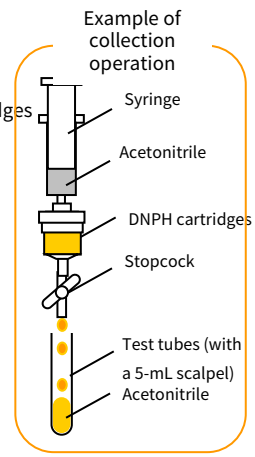
Collecting

- Collect in DNPH cartridges

Collection

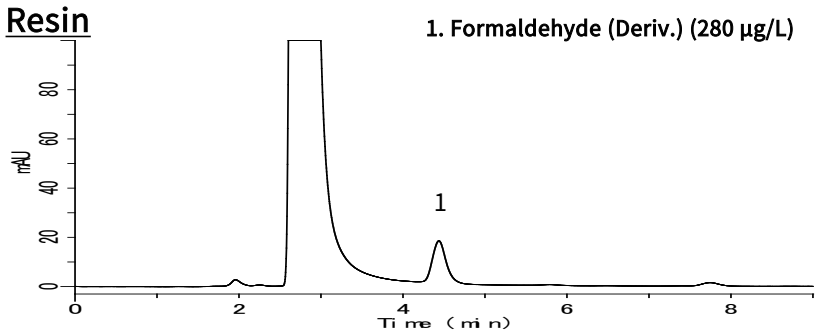
- Acetonitrile 5 mL

Measurement

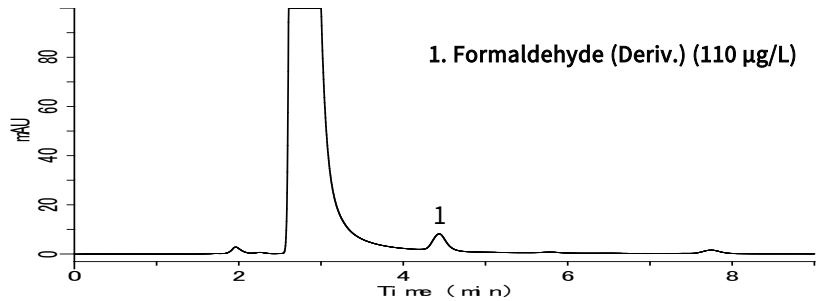


Measurements were made using the sampling bag-method and HPLC.

Resin



Car interior materials



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Overview of the sampling system

This section details the system for recovering aldehyde gases released from materials using the "Sampling Bag Method."

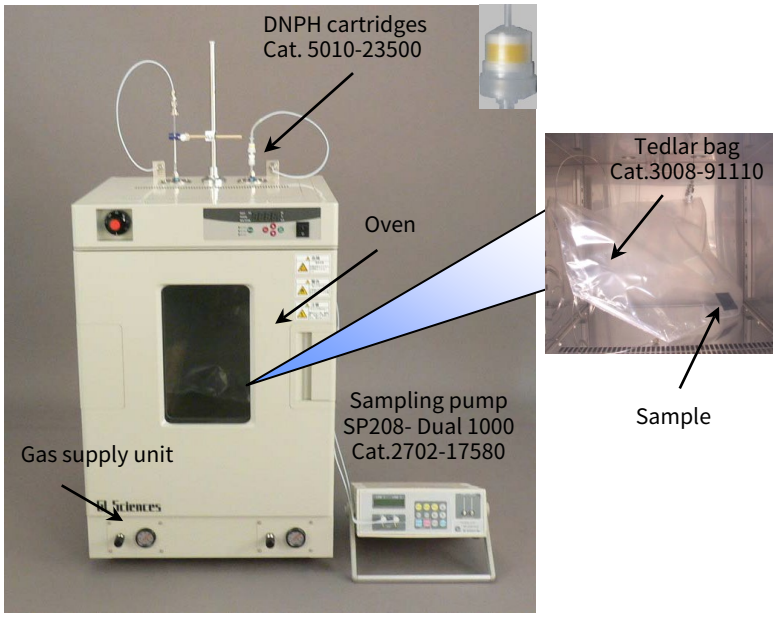
Aldehyde sampler: sampler bag method-compatible sampler set

<Features of the sampling bag method collection system>
- Two samples can be heated and collected simultaneously.
- It can also be used for VOC collection.
- A nitrogen gas supply unit.is included

<DNPH cartridges: GL-Pak mini AERO DNPH>
- Carbonyl compounds are collected using silica gel impregnated with 2,4-dinitrophenylhydrazine (DNPH).
- Due to the use of spherical silica gel, this cartridge has excellent air permeability, high collection efficiency, and low blank.

<Sampling pumps: SP208-Dual 1000>
- Two lines can be used simultaneously.
- A data log can be recorded and is useful for quality control.
- Even if the suction resistance fluctuates, the set flow rate can be maintained and suction is made at a stable rate.

<Tedlar bag>
- Plastic bags are available for a wide range of applications, from inorganic gases to organic solvents.



Sampling bag method collection system

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