

NEW

Selective Sampler SS-2010E

* Japanese Patent 3290893

With this device installed, any set of peaks in the Evolved Gas Analysis curve obtained by Multi-Shot Pyrolyzer or Thermogravimetry (TG) can be heart-cut, and solvent peaks and high-boiling species can also be removed. The technique also eliminates flow path contaminations with polar species, and tars on the metal surfaces which are the problems of conventional rotary valve systems, resulting in reduced analysis time and easy maintenance of separation column and detector.

Features

1. Heart-Cutting Desired Peaks

Any set of peaks in an evolved gas curve can be heart-cut. The components can then be introduced into a capillary column for a specific analysis, allowing significant reduction of time required for analysis.

2. New Flow Switching System (See the figure below)

New Flow Switching System

An inlet adaptor with a flow path switching system utilizing pressure difference of carrier gas has been employed. The flow path is made of deactivated Ultra ALLOY® capillary tube having no dead volume or cold spots.

Automatic adjustment of purge gas pressure

The system automatically adjusts the purge gas pressure against changes of the separation column length and its inner diameter

Automatic Flow Switching

The timing of flow path switching can be programmed from Multi-Shot Pyrolyzer temperature controller. Also flow path switching can be manually performed.

Various atmosphere gases (He, Air, etc.) can be used

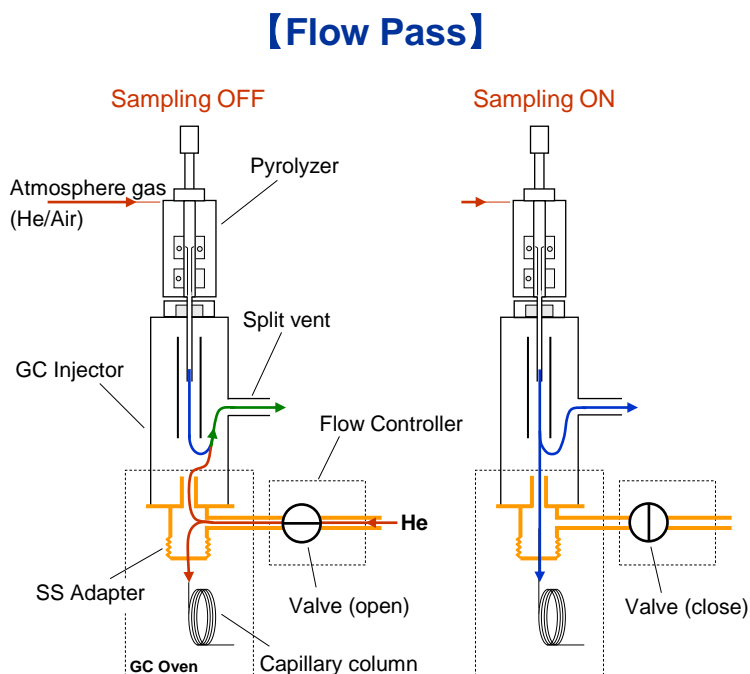
Using air as a sample atmosphere gas gives thermal information under oxidative environment.

3. Simple Construction with Easy Installation

The installation is simple and easy. Just attach a selective sampler adaptor (SS adaptor) to the split/splitless inlet.



SS-2010E Flow Controller



Application: Analysis of a paper surface sizing agent

The EGA thermogram shown in Fig. 1 was obtained by the evolved gas analysis (EGA), in which when a paper sample was continuously heated to a higher temperature, the gases evolving from the paper sample were directly detected real time by a detector such as MSD. Peaks derived from the pyrolysis of the main component of paper are observed in Zone A, and peaks originating from the surface sizing agent of paper are observed in Zone B. Fig. 2-1 shows a pyrogram obtained by the conventional flash pyrolysis, but this method makes it very difficult to analyze, because the peaks from the main component of paper and the sizing agent are observed in a single pyrogram. On the other hand, the chromatogram in Fig. 2-2, obtained by heart-cutting Zone B, shows only the peaks derived from the sizing agent, making the analysis much easier.

Fig. 1 Evolved Gas Analysis curve of a coated paper

100 - 500 °C (20 °C/min)

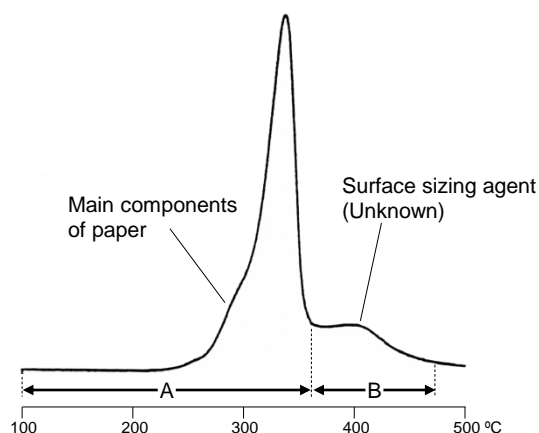


Fig. 2-1 Pyrogram obtained by flash pyrolysis

(Pyrolyzates mixture of cellulose and polystyrene-based sizing agent as the main components.)

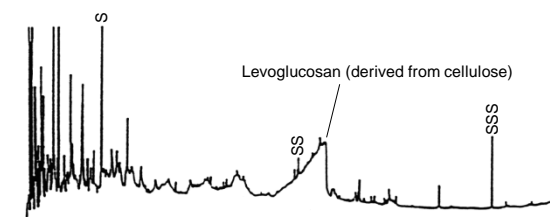
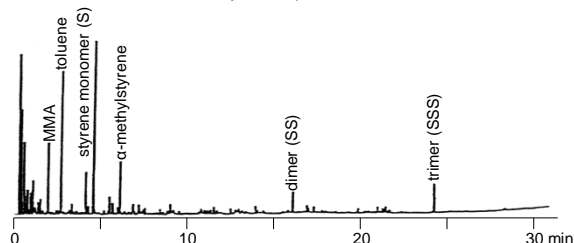


Fig. 2-2 Chromatogram obtained by heart-cutting Zone B

(Pyrolyzates of polystyrene-based surface sizing agent as the main component)



As shown above, the Selective Sampler can be used with a Multi-Functional Pyrolyzer, which has a heating furnace, and various other thermal analysis instruments to easily heart-cut any temperature zone. The heart-cut components can be cryo-trapped at the head of a separation column then analyzed by GC. In addition, by using air as an atmosphere gas (with Carrier Gas Selector CGS-1050Ex), changes in polymer state by analyzing the gases generated during the pyrolysis of the sample in air and oxidation reactions at high temperatures can be measured. Further, this device helps minimize the contaminations of detectors (ECD, MS, etc.) by blocking unwanted solvents and high-boiling components, such as TMS agents, from entering into the separation column. This results in a significant reduction in analysis time and baking time, as well as extending the life of separation columns.

Specifications

- ◆ Flow path switching system by automatic pressure control
- ◆ Maximum use temperature: 420 °C (inlet adaptor temperature)
- ◆ Purge gas control range: Column head pressure up to 450 kPa (at 600 kPa purge gas supply pressure)
- ◆ Power requirement: 100 - 240VAC, 40VA
- ◆ Compatible GC: Agilent 8890/8860/7890/7820GC, SCION GC456, Shimadzu GC-2030/2010/17A, Thermo TRACE1600/1610/1300/1310GC