

Applications Using Carrier Gas Selector Part 1 : Pyrolysis of Polystyrene (PS) in Air

Pyrolysis gas chromatography, PY-GC, is usually performed in an inert carrier gas such as helium. But there are some methods, such as combustion studies or investigations of toxic gas evolution which require an air atmosphere. These methods require careful modifications to the instrumentation. Fig. 1 shows the Carrier Gas Selector, CGS-1050E, which is a pyrolyzer accessory for convenient switching of the gas used during pyrolysis. Fig. 2 shows the advantages of this accessory. Fig. 2A is a chromatogram of pyrolyzates generated in an air atmosphere, and Fig. 2B shows a pyrogram run in helium. Pyrogram A has oxygen-containing compounds and aromatics (shown in red) that are not seen in pyrogram B. The Carrier Gas Selector also makes possible pyrolysis studies in other atmospheres, producing unique information not obtainable in conventional pyrolysis in helium.

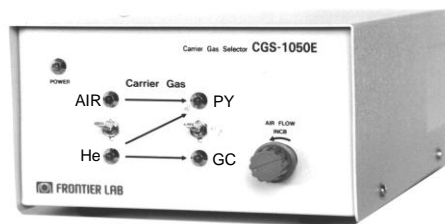


Fig. 1 Carrier Gas Selector (CGS-1050E)

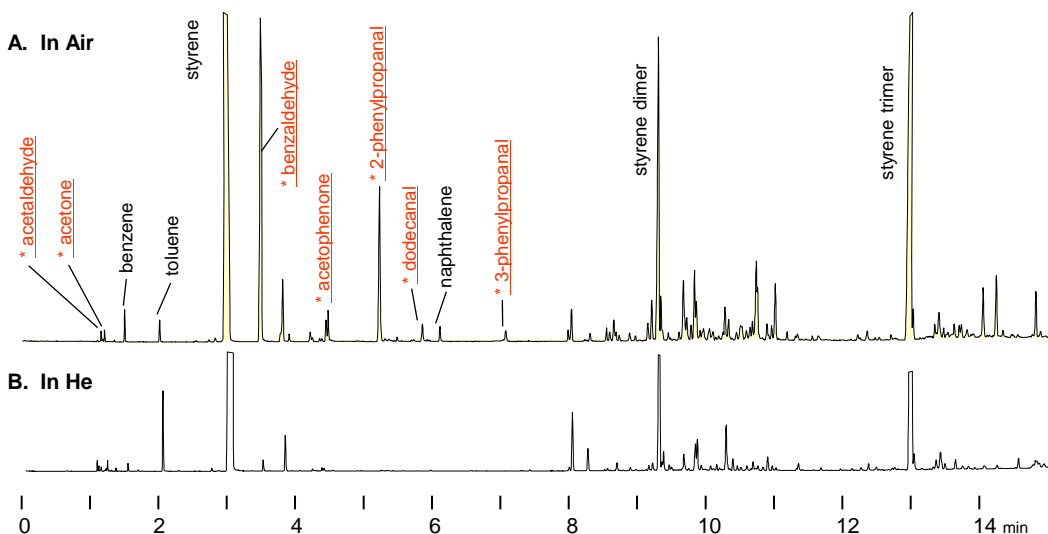


Fig. 2 Comparison of Pyrograms of PS Obtained in Helium and in Air

Pyrolysis temp. : 550°C, Carrier gas flow rate : 60ml/min, Column head pressure : 140kPa
 Separation column : 5% diphenyldimethylpolysiloxane, Length 30mm 0.25mm id., Film thickness 0.25µm, (UA5-30M-0.25F, Frontier Lab)
 GC oven temp. : 40°C (1min) → 20°C/min → 320°C, Injection port temp. : 320°C, Sample : 30µg, Detector : FID

Keyword : Polystyrene, Carrier Gas Selector, Pyrolysis in Air

Applications : General Polymer Chemistry, Environmental Assessment, Work Environment Analysis

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