

Features of Double-Shot Pyrolyzer® PY-2020D & iD

Part 2: High Performance and High Reliability of Pyrograms

Inertness of the Sample Path and Minimal Dead Volume

In Pyrolysis, it is crucially important that the entire sample path be inert with minimal dead volume. This applies to the pyrolyzer, its interface, and the GC column, all the way to the detector. Before the column, the sample path is contained within a quartz pyrolysis tube which extends from the furnace through the interface (ITF), a low-volume metal needle into the GC injection port, and a fused silica liner. All metal parts exposed to the sample are deactivated by Frontier's proprietary technology used in manufacturing Ultra ALLOY® metal capillary columns. (Note 1)

Before each instrument is shipped, performance is confirmed with a test sample (Test Mix-1). It is injected into the Pyrolysis furnace, and the chromatogram is compared with an injection directly into the GC injection port (without the Pyrolyzer). Since peaks 1 through 9 in the chromatogram are substantially the same, it demonstrates that there are no abnormalities, minimal dead volume and no active sites. Even the polar compounds 2, 3, 5, and 8 are not affected by the pyrolyzer. As this performance has never been achieved by conventional pyrolyzers before, Frontier add the passing with this test to the specifications of PY-2020D/iD.

Note 1: Because the pyrolyzates contain a large amount of high boiling components such as tars, the GC column needs to be more resistant to contamination. The Ultra ALLOY® metal capillary column, which is standard in the Double-Shot Pyrolyzer, has four times greater resistance against contamination.

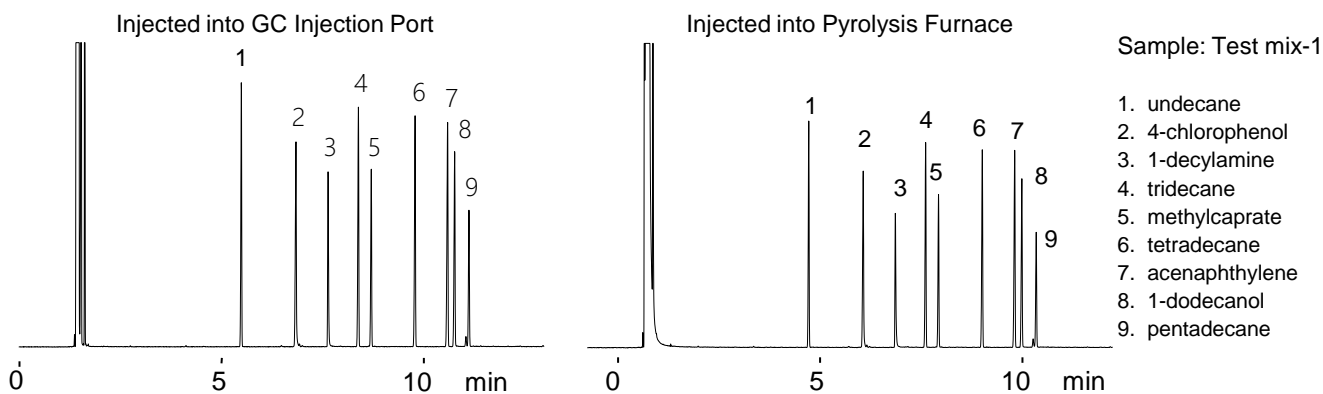


Fig.1 Demonstration of the PY-2020D's Inertness and minimal Dead Volume

Separation column : 5% diphenyldimethylpolysiloxane, 30m, 0.25mm id, Film thickness: 0.25µm (UA5 - 30M - 0.25F, Frontier Laboratories)
 GC oven temp : 70°C→10°C/min→200°C, injection port temp : 320°C, Detector : FID 350°C, Pyrolysis furnace temp : 400°C, PY-GC ITF temp : 320°C, Carrier gas : He 140kPa, Split ratio : 1/60, Sample : Test Mix-1, 1µL, 500ppm (hexane solution)

Keywords : Basic Performance, Py/GC system, Inertness, Text Mix-1

Products used : Multi-functional pyrolyzer, UA-5

Applications : Polymer Chemistry, Environmental Science, Quality Assurance

Related technical notes :

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