

## Three Analytical Techniques of Double-Shot Pyrolyzer® PY-2020D & iD Part 2 : Instant Pyrolysis (Single-Shot Technique)

In the instant pyrolysis technique, a polymer material is heated to 400~600°C in an extremely short period of time, less than 20 msec, and resulting fragments generated is analyzed by gas chromatography to give a pyrogram. The pyrogram provides an insight into the chemical structure of the polymer. Fig. 1 shows the structure of the Pyrolyzer (Frontier Lab Ltd.). The operation is briefly described. A sample cup loaded with a sample is held at the bottom of the single shot sampler, and it is set so that the sample cup is positioned at (A) in Fig. 1, where the temperature is near ambient temperature.

Pressing the sample drop button drops the sample cup to the position (B), the center of heating furnace whose temperature has been set previously. Components produced travel through the interface heater (300°C) and deactivated interface and are introduced to the GC injection port.

The advantages of this system, which uses gravity to drop the sample to the pyrolysis furnace, include rapid pyrolysis and excellent reproducibility of pyrograms with minimal personal differences.<sup>1,2)</sup> Also by minimizing cold spots between the furnace and the GC injection port, high boiling components (e.g. C<sub>40</sub>) and polar components can be introduced to the separation column without absorption in the flow path.<sup>3)</sup>

When the analysis is completed, the sample cup can be easily retrieved using a tool, Eco Pickup, by inserting it into the quartz pyrolysis tube.

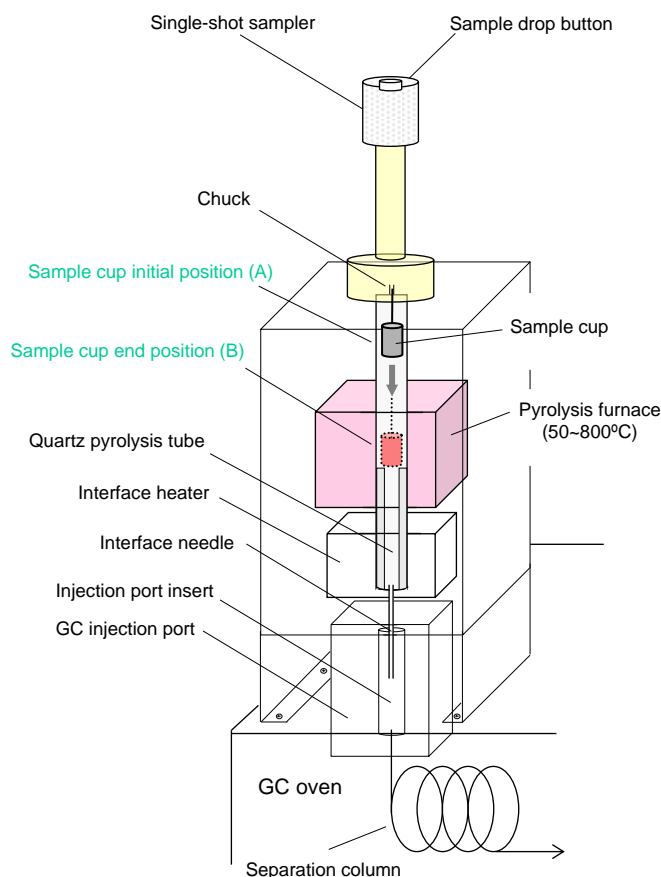


Fig. 1 Structure of a micro furnace Pyrolyzer

- 1) C. Watanabe, *Bunseki*, 1996, 9, 747
- 2) *Double-Shot Pyrolyzer® Tech Note, PYT-001E*
- 3) *Double-Shot Pyrolyzer® Tech Note, PYT-002E, PYT-003E*

**Keywords :** Basic Performance, Flash Pyrolysis, Single-Shot Technique, Structure

**Products used :** Multi-functional pyrolyzer

**Applications :** General Polymer Analysis

**Related technical notes :**

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