Abstract:
When a vertical micro-furnace pyrolyzer is adopted for pyrolysis-gas chromatography (Py-GC), the sample is usually introduced into the center of the preheated pyrolysis chamber by mounting it in a small cylindrical sample cup with a dead-end bottom having a volume of a few dozens micro liters which in some case might be responsible for a stagnant flow of carrier gas in the pyrolysis chamber to cause undesirable secondary reactions of the resulting pyrolyzates and/or peak broadening phenomenon. In order to quench the dead-end flow, a new “flow-through” sample cup in which a small hole (ca. 1.0 mm i.d.) was drilled through its bottom was developed, and its basic characteristics were first examined by measuring the pyrogram of polycarbonate (PC) at 600°C under different carrier gas flow rates. Various secondary products such as phenol and p-isopropenyl phenol derived from bisphenol A, the main pyrolyzates of PC were observed when the conventional sample cup without the hole was used under a relatively lower flow rate as 25 ml/min. However, they were markedly decreased when the “flow-through” sample cup was used. Furthermore, the resolution of the lower boiling point pyrolyzates (C1–C8) from high density polyethylene (HDPE) was also much improved by use of the “flow-through” sample cup.

Frontier Labs products used:
Multi-functional Pyrolyzer, UA*-5, Flow-through Eco-Cup LHF