



## Analysis Examples Using Carrier Gas Selector

### Part 4: Pyrolysis of Polyethylene (PE) in Air

Using Carrier Gas Selector (CGS-1050E), Selective Sampler (SS-1010E), and MicroJet Cryo Trap (MJT-1030E), flash pyrolysis of polyethylene (PE) was performed at 550° C both in air and He atmosphere. Pyrolyzates were analyzed by GC/MS. Fig. 1 compares pyrograms obtained both in air and He atmosphere (partly enlarged). In the pyrogram obtained in He atmosphere, diolefins, olefins, and n-paraffin arising from random fission or disproportionation of the PE main chain were found. On the other hand, in the pyrogram obtained in air, carbon dioxide and aldehydes with successive number of carbons were observed, apparently resulted in the thermal decomposition and oxidation in air at high temperature.

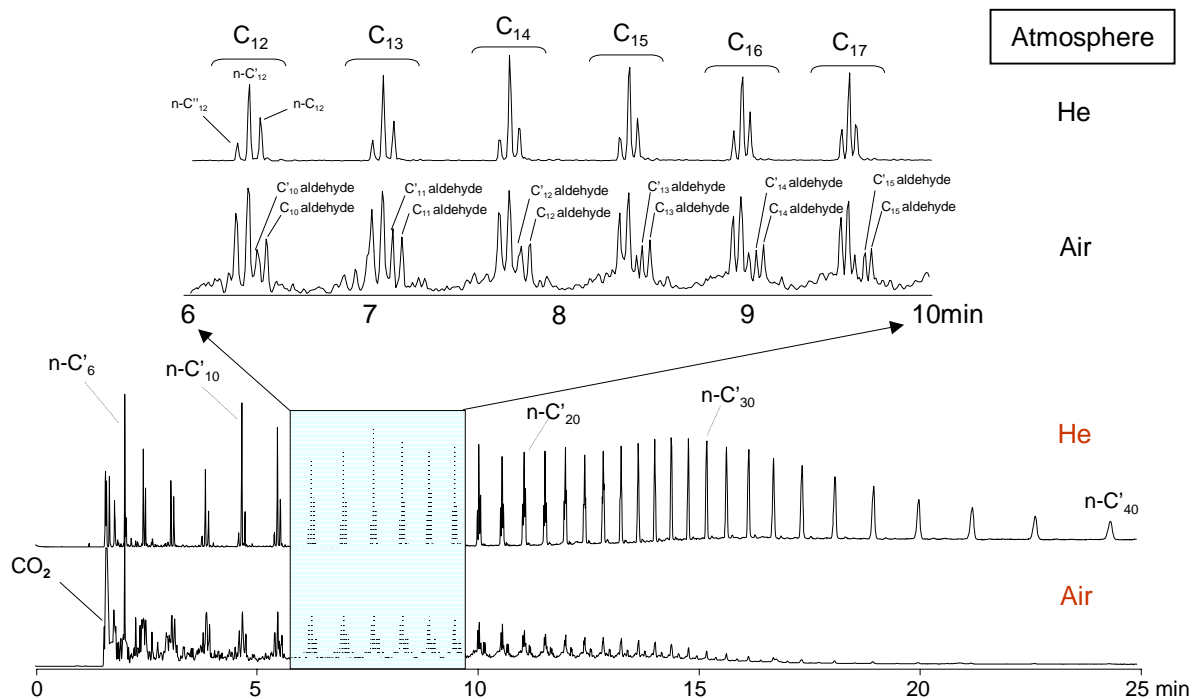


Fig. 1 Comparison of Pyrograms of Polyethylene Obtained in Air and in Helium Atmosphere

Pyrolysis temp: 550° C, Carrier gas: Helium, Column flow rate: 1ml/min, Carrier gas total flow rate: 60ml/min  
Separation column: Ultra ALLOY-5 (5% diphenyldimethylpolysiloxane), Length: 30m, Id: 0.25mm, Film thickness: 0.25µm  
GC oven temperature: 40 (1min hold) ~ 320° C (20° C/min), Injection port temp: 320° C, Sample size: 30µg

Reference: Hosaka, et al., 5th Polymer Analysis Symposium, II-4, p43-44 (2000)

**Keyword: Polyethylene, Pyrolysis in He and in Air, Carrier Gas Selector**

**Applications: General Polymer Analysis, Environmental Analysis**

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