

Analysis Examples Using Carrier Gas Switcher

Part 4: Pyrolysis of Polyethylene (PE) in Air

Using Carrier Gas Switcher (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 generated from thermal decomposition and oxidation in air at high temperature.

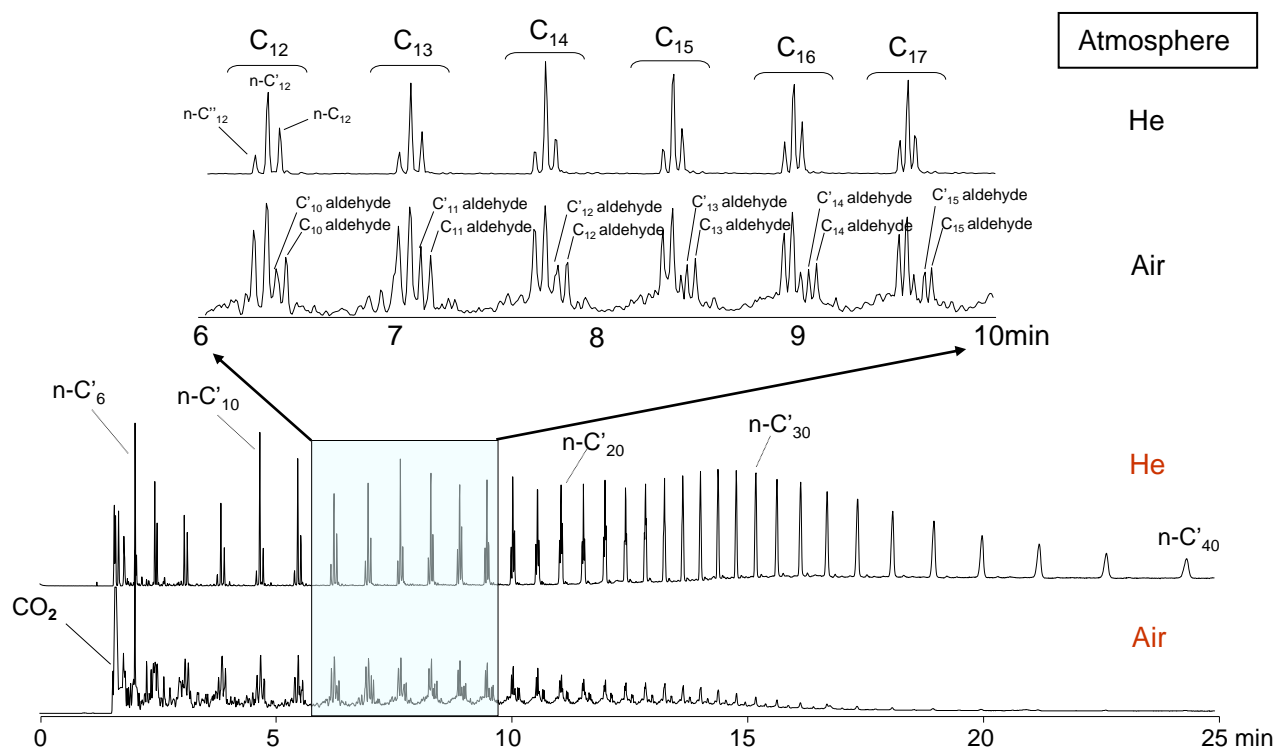


Fig. 1 Comparison of Pyrograms of Polyethylene Obtained in Air and in Helium Atmosphere

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° C (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)

Keywords : Polyethylene, Pyrolysis in He and in Air, Carrier Gas Switcher

Products used : Multi-functional pyrolyzer, Carrier Gas Selector, Selective Sampler, MicroJet Cryo-Trap, UA-5

Applications : General Polymer Analysis, Environmental Analysis

Related technical notes :

Please forward your inquiries via our web page or send us a fax message.

R&D and manufactured by :
Frontier Laboratories Ltd.

Phone: (81)24-935-5100 Fax: (81)24-935-5102
<http://www.frontier-lab.com/>