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Waters Application Notebook

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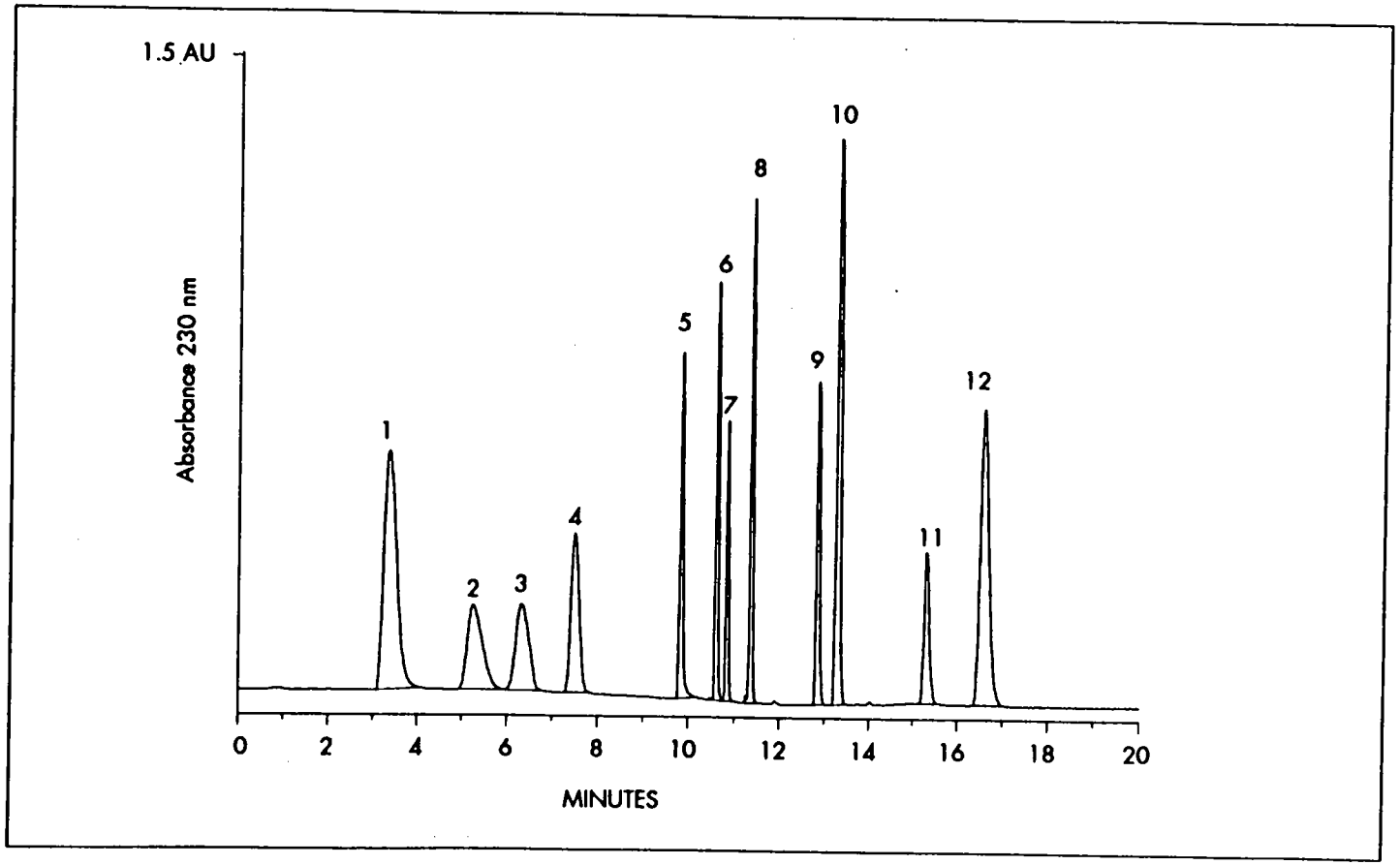
003

Rapid Polyolefin Additive Separation using Nova Pak® C_{18}



Gradient HPLC with flow programming can be used to separate these 12 polyolefin additives in less than 17 minutes. The Irgafos 168 phosphite ester appears as a single peak, with no evidence of degradation.

Conditions:

Column: Nova-Pak® C_{18} (3.9 x 150 mm)

Column Temp.: 50°C

Eluent A: Acetonitrile/Water (60:40)
Eluent B: Acetonitrile

Gradient:

Time	Flow	%A	%B	Curve
Init	0.80	100	0	*
6.00	1.50	0	100	6
10.00	1.80	0	100	6

Detection: UV at 230nm

Injection volume: 15 µl

Sample Components:
1) Tinuvin P
2) Irganox MD 1024
3) BHT
4) BHEB
5) Goodrite 1330
6) Cyasorb UV 531
7) Isonox 129
8) Ferro AM 340
9) Irganox 3114
10) Irganox 1010
11) Irganox 1076
12) Irgafos 168, (phosphite ester)

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Objective:

This separation demonstrates that flow programming, along with a gradient is a powerful technique for separating a large number of polymer additives in a short amount of time. This gradient does not hydrolyze the phosphite ester into multiple peaks, as evidenced by the single, symmetrical Irgafos 168 peak.

Details:

See reference for microwave and ultrasonic extraction methods.

System:

The system used consisted of a Powerline 600 solvent delivery system, with the 490 UV detector, 712 WISP autosampler, and the 860 Expert-Ease data system.

References:

Nielson, R., "Extraction and Quantitation of Polyolefin Additives", Journal of Liquid Chromatography, Vo. 14, #3, 1991