



VARIAN

Application Note SI-01937

Enhanced ELSD Sensitivity of Parabens using Sub-Ambient Evaporation

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Introduction

Parabens (esters of para-benzoic acid) are widely used as food additives and synthetic preservatives in cosmetics and personal care products, and in pharmaceutical formulations. Common types include methyl paraben (E218), ethyl paraben (E214) and propyl paraben (E216). These low molecular weight compounds are relatively volatile but can be easily detected by the Varian evaporative light scattering detector. The Varian ELSD responds to all compounds that are less volatile than the mobile phase. At higher ELSD operating temperatures, semi-volatile analytes may evaporate along with the eluent making detection difficult or even impossible. The Varian ELSD can be operated at very low temperatures (or even ambient temperature) so that loss of semi-volatile sample components can be minimized, preserving sample integrity and offering maximum sensitivity. However, it also operates at higher temperatures to reveal the presence of more volatile compounds.

Instrumentation

Column: Pursuit C18, 5 μ m, 150 mm x 2.1 mm (A3000150X021)

Detection: Varian ELSD (neb= 30 °C, evap= as shown, gas=1.4 SLM)

Materials and Reagents

Eluent A: Water

Eluent B: Acetonitrile

Sample Preparation

Parabens

Conditions

Gradient: 5-70 % B in 5 min, 70-95% B in 12 min

Flow Rate: 0.2 mL/min

Results and Discussion

These low molecular weight compounds are relatively volatile but can easily be detected by operating the Varian ELSD at low temperature, such as 30 °C. However, further improvements in the recovery of the lower molecular weight, methyl paraben, can be achieved at sub-ambient temperatures of 20 °C, as shown in figure 1.

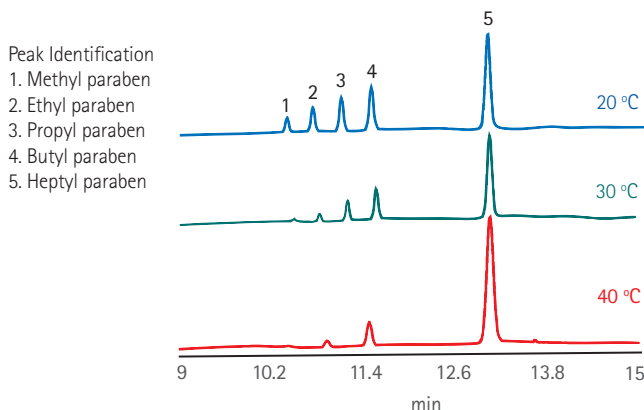


Figure 1. Analysis of parabens using low temperature ELSD.

Conclusion

By manipulating the operating conditions, the Varian ELSD detects semi-volatile parabens, thus conserving sample integrity and providing maximum sensitivity. The Varian ELSD surpasses other ELSDs for low temperature HPLC applications with semi-volatile compounds. Its innovative design represents the next generation of ELSD technology, providing optimum performance across a diverse range of HPLC applications. The Varian ELSD's unique gas control permits evaporation of high boiling solvents at very low temperatures. For example, 100% water at a flow rate of 5 mL/min can be removed at 30 °C. The novel design of the Varian ELSD provides superior performance compared to competitors' detectors for the analysis of semi-volatile compounds.

These data represent typical results. For further information, contact your local Varian Sales Office.

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