

Semi-Volatile Pharmaceutical Compound Analysis using Low Temp ELSD

Varian ELSD

Advantage Statement: The Varian Evaporative Light Scattering Detector is a powerful tool for detecting any sample that is less volatile than the mobile phase in HPLC applications, irrespective of the optical properties of the compounds of interest.

The ELSD offers distinct advantages over more conventional UV or DAD detection, particularly for gradient separation. In the past, one disadvantage for some ELSD designs has been that high operating temperatures required to fully evaporate the eluent can cause loss of semi-volatile, small molecules, e.g. drug candidates. The Varian Evaporative Light Scattering Detector features design improvements to overcome these drawbacks. For the detection of semi-volatile components in a sample, the Varian ELSD can be operated with the heaters off (ambient temperature operation) or with the nebulizer and evaporator controlled at low temperatures.

Figure 1 shows a separation of a test mixture of four compounds by reversed phase HPLC, which is typically used to assess HPLC system performance for pharmaceutical analysis.

Column: C18 5 μ m, 150 x 4.6 mm
Eluent A: Water + 0.1 % TFA
Eluent B: ACN + 0.1 % TFA
Gradient: 60-90 % B in 5 min
Flow Rate: 1.0 mL/min
Detection: Varian ELSD

Peak Identification
1. Acetanilide
2. Indapamide
3. Ibuprofen
4. Dibutylphthalate

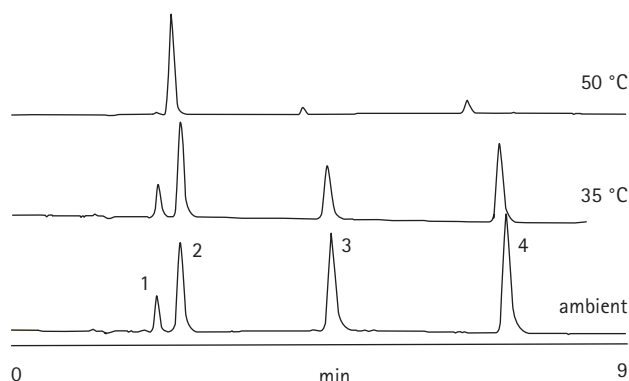


Figure 1. Separation of a test mixture of four compounds by reversed phase HPLC using the Varian ELSD.

In this analysis, peak 2, indapamide, is essentially non-volatile but the remaining three peaks (acetanilide, ibuprofen and dibutylphthalate) are semi-volatile to different degrees. The effect of operating temperature on the recovery of these three semi-volatile compounds is clearly illustrated. With the nebulizer and evaporator running at the same temperature, 50 °C, peak 2 gives a large response but the other more volatile components give very poor peak response, primarily due to loss through evaporation. As the nebulizer/evaporator temperatures are reduced to 35 °C, and further when they are switched off and the instrument is running at ambient temperature (nominally 26 °C), the detector shows much better recovery of the semi-volatile components with no deterioration in baseline stability.

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

NOTICE: Varian, Inc. was acquired by Agilent Technologies in May 2010. This document is provided as a courtesy but is no longer kept current and thus will contain historical references to Varian. For more information, go to www.agilent.com/chem.



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