Analysis of semivolatile pharmaceutical compounds using the Agilent 385-ELSD Evaporative Light Scattering Detector

Technical Overview

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The Agilent 385-ELSD 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.

Evaporative light scattering (ELS) detection offers distinct advantages over more conventional UV or DAD detection, particularly for gradient separation. In the past, one disadvantage for some ELS detector designs has been that high operating temperatures required to fully evaporate the eluent can cause loss of semivolatile, small molecules, for example, drug candidates. The Agilent 385-ELSD features design improvements to overcome these drawbacks. For the detection of semivolatile components in a sample, the Agilent 385-ELSD can be operated with the heaters off (ambient temperature operation) or with the nebulizer and evaporator controlled at low temperatures.

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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.

In this analysis, peak 2, indapamide, is essentially nonvolatile but the remaining three peaks (acetanilide, ibuprofen and dibutylphthalate) are semivolatile to different degrees. The effect of operating temperature on the recovery of these three semivolatile 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 semivolatile components with no deterioration in baseline stability.

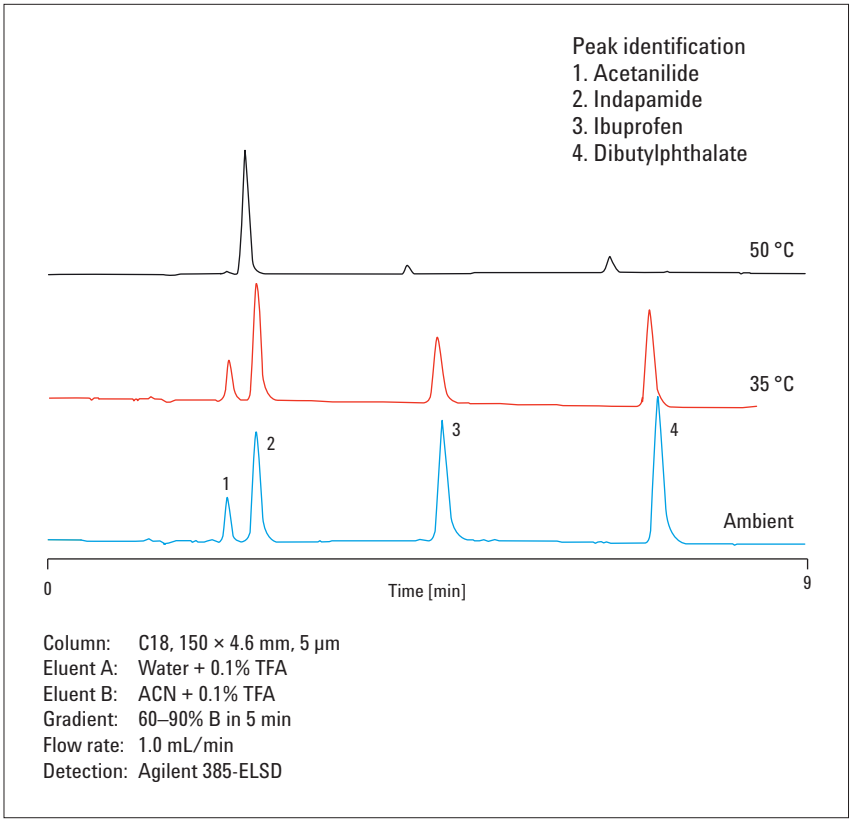

Figure 1
Separation of a test mixture of four compounds by reversed phase HPLC using the Agilent 385-ELSD.

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