Complementary ELSD for LC-MS

Varian ELSD

Advantage Statement: LC-MS of compounds with little or no UV chromophore is enhanced by using the Varian Evaporative Light Scattering Detector, because the ELSD functions independently of the optical properties of the analyte.

LC-MS is recognized as a key analytical tool for assessing the identity, purity and quantity of compounds present in samples taken from a very wide range of application areas. Detection of some compounds, such as those with little or no UV chromophore, can benefit from enhanced LC-MS capability by interfacing with the Varian ELSD, since its mode of operation does not rely on the optical properties of the analyte. As the chromatographic eluent requirements for ELSD are very similar to those for MS detection, any method developed for the Varian ELSD can be directly transferred to MS, saving valuable LC-MS method development time. Thereafter, the evaporative light scattering detector can be coupled to any LC-MS system, normally with the flow from the column split, part to the ELSD and part to other detectors (e.g. UV-MS).

The structural information obtained from an LC-MS system is extremely useful for monitoring pharmaceutical combinatorial libraries in high throughput screening (HTS) applications.

However, in addition to structural, identity and purity detection, concentration information is also required. This is provided by ELSD, which responds to all compounds that are less volatile than the mobile phase. The low temperature operation of the Varian ELSD offers distinct advantages for the analysis of semi-volatile compounds. The benefits of the Varian ELSD as a complementary detector are apparent from detector data obtained on an LC-MS-UV-ELSD system for verapamil and diazepam (Figure 1).

The compounds were prepared in solution at a ratio of 1:1, prior to injection onto the HPLC system. By LC-MS, the ratio of verapamil to diazepam is calculated at 3:1, because verapamil is not easily ionized by this technique. Compare this to the UV results (at 254 nm), where the ratio is calculated at 20:1, which is a reflection of the difference in extinction co-efficients between the compounds.

The results obtained using the Varian ELSD show the mixture to be truly 1:1, because the ELSD does not rely on the optical properties of verapamil or diazepam, or their ability to form charged species. This confirms that the Varian ELSD is a powerful tool in pharmaceutical analysis capable of generating vital supporting data to LC-MS.

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Figure 1. Detection of verapamil and diazepam on an LC-MS-UV-ELSD system.

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

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