Fast Analysis of *Ginkgo biloba* Leaf Extract by HPLC with ELSD

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**Introduction**  
The leaves of *Ginkgo biloba* L. trees are used in Chinese medicine for the treatment of circulatory disorders. More recently, with the advent of the nutraceutical industry, *Ginkgo biloba* leaf extracts have become one of the most important phytopharmaceuticals. They are used in the treatment of asthma and bronchitis as well as in the management of cerebrovascular and peripheral circulatory disorders. The potency of leaf extracts is attributed to the presence of ginkgolides A, B, C, J and M, with ginkgolide B being the most active. Ginkgo leaf also contains terpene compounds such as bilobalide, and a number of flavonoids. A standardized extract should contain 6-7 % of these terpene lactones. Consequently, there is a need in the phytopharmaceutical industry to quantify the amount of active components in ginkgo leaf extracts to standardize nutraceutical preparations. The Varian evaporative light scattering detector (ELSD) is universal, and is not dependent on the optical properties of the compound. Consequently, ELSD provides a better alternative to UV-vis detection for the analysis of ginkgolides. The ELSD is capable of detecting any compound that is less volatile than the mobile phase, is compatible with a wide range of solvents and is insensitive to solvent gradients, displaying excellent baseline stability.

**Instrumentation**  
Column: Silica 3 µm, 150 x 4.6 mm  
Detection: Varian ELSD (neb=40 °C, evap=70 °C, gas=1.2 SLM)

**Materials and Reagents**  
Eluent A: 0.05 % TFA in 95 % water:5 % methanol  
Eluent B: 0.05 % TFA in methanol

**Conditions**  
Flow Rate: 1.0 mL/min  
Injection Volume: 20 µL  
Gradient: 25-75 % B in 35 min

**Results and Discussion**  
The separation in Figure 1 shows that several ginkgolides can be detected in a single run, without the need for derivatization to enhance their response. As a result, the ELSD provides a fast and cost effective method of detection for the analysis of ginkgo biloba leaf extract.

![Figure 1. No need for derivitization in the separation of ginkgolides using the Varian ELSD.](image)

**Peak Identification**  
1. Bilobalide  
2. Ginkgolide C  
3. Ginkgolide A  
4. Ginkgolide B

**Conclusion**  
The Varian ELSD successfully distinguished several ginkgolides without the need for derivitization. It 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 detectors from other vendors for the analysis of semi-volatile compounds.