Evaporative Light Scattering Detector in NP-HPLC analysis of FAME Oxidation Products

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The use of an ELS detector in NP-HPLC for quantitative analysis of oxidation products in FAME obtained from oils is evaluated in this study. Results have shown that the ELS detector enables the quantitative determination of the hydroperoxides of oleic and linoleic acid methyl esters as a whole and connected in series with a UV detector makes it possible to determine both groups of compounds by difference, providing useful complementary information. The limits of detection (LOD) and quantification (LOQ) found for hydroperoxides were 2.5 and 5.7 $\mu g\ mL^{-1}$ and precision expressed as coefficient of variation was lower than 5%. The ELS detector shows limitations to determine the low contents of secondary oxidation products in the direct analysis of FAME oxidized at low or moderate temperature. Analysis of FAME samples obtained either from high linoleic sunflower oil (HLSO) or high oleic sunflower oil (HOSO) and oxidized at 80ºC showed that only ketodienes formed from methyl linoleate can be determined in samples with relatively high oxidation, being the LOD and LOQ 0.2 and 0.4 mg g^{-1} FAME, respectively, at the analytical conditions applied. The ELS detector also enabled the determination of methyl *cis*-9,10-epoxystearate and methyl *trans*-9,10-epoxystearate, which were resolved at the chromatographic conditions applied. Results showed that these compounds, which are formed from methyl oleate, were not detected in the high-linoleic sample, but occurred at non-negligible levels in the oxidized FAME obtained from HOSO.