RAPID METHOD FOR THE DETERMINATION OF USUAL CIS-TRANS FATTY ACIDS BY CAPILLARY ZONE ELECTROPHORESIS

Patrícia Mendonça de Castro Barra, Renata de Jesus Coelho Castro, Sabria Aued-Pimentel, Simone Alves da Silva, Marcone Augusto Leal de Oliveira, Chemistry Department, Federal University of Juiz de Fora, Juiz de Fora, Brazil. Adolfo Lutz Institute, São Paulo, Brazil.

The fatty acids (FA) profile determination can be used as indicators related to human health and nutritional status, and they have been used in many clinical and epidemiological studies. Within this context an alternative methodology for simultaneous analysis of usual cis-trans FA such as stearic, elaïdic, oleic, palmitic, linoleic and linolenic acids using capillary zone electrophoresis (CZE) under UV indirect detection at 224 nm and analysis time at 9.0 min was proposed. The CZE methodology was optimized through the 2³ central composite design, having as factors Brij 35, acetonitrile and 1-octanol. The optimized condition was consisted of 15.0 mmol L⁻¹ of NaH₂PO₄ / Na₂HPO₄ at pH = 6.86, 4.0 mmol L⁻¹ of SDBS, 8.3 mmol L⁻¹ of Brij 35, 45% v/v of ACN and 2.1% of 1-octanol. The FA quantification was performed using response factor (Rᶠ) approach taking into account tridecanoic acid as internal standard. Rᶠ approach is very interesting because promotes high analytical throughput for real samples analysis. In the present case six analyses within 120 min is possible to perform taking into account sample preparation step. The CZE method was compared to AOCS official GC method Ce 1j-07 through paired sample t test and no significant difference was observed in 95% confidence interval for analysis of distinct samples, such as olive oil, soy oil, hydrogenated vegetable fat, butter, margarine and filled wafer. The CZE methodology presents simple sample preparation step, short analysis time; low organic solvent consume; use of non specific columns and high analytical throughput as advantages.