

Coupled separation techniques in lipidomics research

J. Walczak, Sz. Bocian, B. Buszewski

Department of the Environmental Chemistry and Bioanalytics,

Faculty of Chemistry, Nicolaus Copernicus University,

7 Gagarin St. PL 87-100 Torun, Poland.

E-mail: walczak-justyna@wp.pl

Phospholipids (PL) play a variety of biological functions and are fundamental to many life processes. Special role stems from the fact that, along with cholesterol and proteins, they are an important component of biological membranes deciding on their semi-permeable nature [1]. Phospholipids play a crucial role in the inhibition of degenerative liver, heart, and nervous system diseases [2]. Polyunsaturated fatty acids (PUFA), such as omega-3 and omega-6 are precursor of tissue hormones, reducing the concentration of triglycerides and cholesterol in the blood serum [3]. The growing need for the identification and the determination of lipids in complex mixtures and biological matrices is mainly related to the development of lipidomics. In this study, separation and identification of phospholipid molecular species were performed by using liquid chromatography coupled with triple quadrupole mass spectrometry (LC-ESI-MSn). Additionally, using new stationary phases to separate the most abundant classes of phospholipids in food products (egg yolk, milk). Home-made chemically bonded stationary phases, containing e.g. diol, phosphate, amine, and octadecyl groups have been employed in the separation of polar lipids. Depending on the composition of mobile phase the separation can be done in reversed phase (RP) and hydrophilic interaction liquid chromatography (HILIC).

References

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