**FAST, SIMPLE AND SIMULTANEOUS DETERMINATION OF PERFLUORINATED COMPOUNDS AND THEIR POTENTIAL PRECURSORS IN DIFFERENT PACKAGING MATERIALS BY FOCUSED ULTRASOUND SOLID-LIQUID EXTRACTION AND LIQUID CHROMATOGRAPHY-ELECTROSPRAY TANDEM MASS SPECTROMETRY**

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Packaging has become essential in the food manufacturing process since it maintains food safe from external influences, offers preservation and ease transportation, and provides consumers with ingredient and nutritional information (Marsh 2007). During recent years, the production and use of packaging materials has increased enormously in order to meet the huge demand of the food industry. Although packaging manufacturing industry tries to produce food packaging that provides a minimum environmental impact and food safety, recently, the packaging has been found to represent a source of contamination because of the migration of substances from the packaging material into the food (Lau 2000).

Among the different harmful chemicals, due to their extended use as grease and water repellent coatings for food packaging, fluorochemicals have become one of the food safety concerns since certain fluorochemicals have shown carcinogenic and endocrine disrupting properties (Ma 2010). Within this context, the aim of the present work was to overcome the challenge of developing an analytical method for the simultaneous determination of 14 perfluorinated compounds (PFCs), including three perfluoroalkylsulfonates (PFSAs), seven perfluorocarboxylic acids (PFCAs), three perfluorophosphonic acids (PFPAs) and perfluorooctanesulfonamide (PFOSA) and 10 potential precursors including four polyﬂuoroalkyl phosphates (PAPs), four fuorotelomer saturated acids (FTCAs) and two fluorotelomer unsaturated acids (FTUCAs) in different packaging materials, such as popcorn bags, fast food wrappers, beverage cups. In order to achieve this objective the optimization of a focused ultrasonic solid-liquid extraction (FUSLE) method was carried out, since FUSLE can offer short extraction periods (few minutes) with a low consumption of organic solvent (several mililiters). In these sense, the solvent type (Methanol (MeOH), acetone, ethanol, acetonitrile and MeOH (1 % Acetic acid (HOAc)), the extraction time (1-4 min) and consecutive extraction steps (1-3 steps) were studied. In all the cases the analysis was performed by liquid-chromatography-triple quadrupole mass spectrometry (LC-MS/MS). 7 mL of MeOH (1 % HOAc) and a 2.5 min single extraction cycle were sufficient for an exhaustive extraction of the target analytes. The optimized analytical method was validated in terms of recovery (external calibration using isotopically labeled analogues as surrogates) and method detection limits (MDLs). Recovery values in the 69-101 % and 69-98 % range were obtained for samples fortified at 25 ng/g and 50 ng/g concentration levels, respectively, and method detection limits (MDLs) in the 0.6-2.3 ng/g range were obtained. The developed method was applied to the analysis of plastic and cardboard materials.

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