Determination Of Bisphenol A In Canned Foods By Monoclonal Antibody Immunoaffinity Column Clean-Up And High Performance Liquid Chromatography

Chrisi Kapridaki, Niki Maragou, Georgios A. Theodoridis, Gerardo Marchesini and Nikolaos S. Thomaidis

1 Laboratory of Analytical Chemistry, Department of Chemistry, University of Athens, Panepistimiopolis Zografou, 157 71 Athens, Greece ntho@chem.uoa.gr
2 Laboratory of Analytical Chemistry, Department of Chemistry, Aristotle University of Thessaloniki, 540 06 Thessaloniki, Greece.
3 RIKILT-Institute of Food Safety, Wageningen UR, Biomolecular Detection, P.O. Box 230, 6700 AE Wageningen, The Netherlands.

A method for the determination of bisphenol A (BPA) in canned foods by monoclonal antibody immunoaffinity column clean-up and high-performance liquid chromatography was developed. Bisphenol A is an industrial chemical primarily used in production of polycarbonates and epoxy resins and migrates from both packaging materials into foods.

The experimental parameters of the immunoaffinity chromatography were optimized. The optimized parameters were flow rate, loading medium, elution solvent, wash and elution volume and binding capacity. The optimized procedure consists of the following steps: loading with acetonitrile/phosphate buffer (1/10 v/v), washing with 1 ml H2O and elution with 6 ml ACN at a flow rate of 0.2 ml/min. The extracts were dried under a stream of nitrogen at 45°C prior to re-suspension in 1 ml H2O. The samples were analyzed by liquid chromatography-fluorescence detection using an isocratic elution program with water/acetonitrile (40/60 v/v) at a flow rate of 0.4 mL min⁻¹. The calibration range was 1.0-100 μg L⁻¹, with instrumental LOD 0.19 μg L⁻¹. The mean recovery from IAC cartridges was 95.7 %, with RSD 3.6 % (n= 6) for 100 μg L⁻¹. The method LOD was approximately 2.8 ng g⁻¹.

Furthermore, the clean-up results and the retention characteristics of BPA on the immunoaffinity column and BPA-imprinted SPE (MIP SPE) were compared. The immunoaffinity column has been successfully used for the isolation and determination of bisphenol A from canned foods (tuna, mushrooms, pineapple) by HPLC-FLD.

Acknowledgment

The authors would like to acknowledge financial support of this work from the Greek General Secretariat for Research and Technology (05AKMON107).