

19th International Conference on

FOOD PROCESSING & TECHNOLOGY

October 23-25, 2017 | Paris, France

Analysis of bisphenols migrating from food packaging materials using HPLC-MS/MS

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Bisphenol-A (BPA) is one of the most abundant synthetic chemicals in the world due to its uses in plastics. But BPA may mimic hormones and interfere with the endocrine system of glands, so banned on its use in infant feeding bottles. Its adverse effects have led industry to replace it with other bisphenol analogues, such as bisphenol S and bisphenol F in some applications. However, the safety of these analogues has become a matter of debate to their structural similarity with BPA, with data showing them to possess endocrine disrupting potential. The aim of this study is to estimate BPA analogues exposure released from food packaging materials in Korea. High performance liquid chromatography-tandem mass spectrometry (HPLC-MS/MS) was used to determine migrated eight Bisphenols (BPA, BPS, BPF, BPB, BPP, BPZ, BPAF and BPAP). The analytical performance of the method was validated according to the EUR 24105 EN and showed linearity, precision and accuracy within the acceptable range. For 10 compounds, the detection limit (LOD) was calculated to be 1.0~33.1 ug/L, and the limit of quantification (LOQ) value of the validated method was 3.1~100.3 ug/L. The samples were kitchen utensils including cups, baby bottles and made of PC, PES, PP, and PCT etc. The migration tests with food simulants (water, 4% acetic acid, 50% ethanol and n-heptane) were performed under time/temperature conditions. Exposure assessments were carried out to compare estimated daily intakes (EDI) of eight BPA analogues and two phenols with tolerable daily intakes (TDI) established by the European Food Safety Authority. It would be applicable to risk assessment of BPA analogues for the safety management of food packaging materials.

Biography

Joung Boon Hwang has completed her Master's Degree at KyungHee University and worked for 2 years at Doping Control Center, Korea Institute of Science and Technology. She has been working in the department of Food Contact Materials and Packaging at National Institute of Food and Drug Safety Evaluation.

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