9th Euro-Global Summit & Expo on

Food & Beverages

July 11-13, 2016 Cologne, Germany

Comparative migration kinetics into different food simulants influenced by partition coefficients

Daeun Lee^{1,2}, Hyunpyo Jeon¹ and Sanghun Kim^{1,2} ¹Universitaet des Saarlandes, Germany ²University of Science and Technology, South Korea

Materials which are in contact with food may cause migration of chemical substances. To protect consumers from exposure, Regulation (EU) No. 10/2011 specify the standard migration tests. Fortunately, since mass transfer from a plastic material into food is predictable, migration modeling could be regarded as a valid tool to predict 'worst case' migration from food contact plastics into the food simulant. However, due to the uncertainty of food simulant than real food system, one simulant cannot cover as worst case with a tendency. The aim of this study was to predict and develop a migration model of food at pH changing condition. For example, the fermented foods influenced by lactic acid have been shown that the production of acid and lowering pH resulted in an increase in sourness. In mathematical migration modeling, partition coefficients, K_{LF/P} between food and packaging system, are important value influenced by simulant. Quantitative structure-property relationship (QSPR) model by the adaptive neuro-fuzzy inference system was used as data to obtain partition coefficient Ki,F/P. The result was shown that the migration in food simulant 10% ethanol was underestimated than a concept of fermented food system. On the contrary, the migration in the food stimulant, 10% ethanol was overestimated for the migrant Butylraldehyde. These results might be influenced by each chemical interaction and solubility between migrant, polymer and simulant. Moreover, since the worst case of current model cannot cover the migration in different food conditions, food simulant and their interaction should be target of further study for conservative migration modeling.

Biography

Daeun Lee is research assistant of KIST Europe in Environmental Safety Group. In this position, she has monitored, analyzed and coordinated response to Chemical Regulation and Legislation issues such as REACH, FCM and K-REACH.

d.lee@kist-europe.de

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