

[P-41]**Comparison of Calux Bioassay and HRGC/MS Chemical Analysis for the Measurement of Dioxin Levels in Various Environmental Matrices**

Ki Eun Joung¹, Yhoun Hee Chung² and Yhun Yhong Sheen

¹College of Pharmacy, Ewha Womans University, Seoul, Korea ²Department of Water Environment Research, National Institute of Environmental Research, Incheon, Korea

Two different methods, HRGC/MS chemical analysis and CALUX bioassay were used for testing environmental water and soil samples if CALUX bioassay is applicable for the measurement of dioxin-like compounds. Furthermore, REPs for 17 kinds of dioxin-like compounds were determined and compared with WHO-TEFs of corresponding compounds. In the water samples, HRGC/MS-TEQs ranged from 0 to 2.281 pg-TEQ/L, and the highest TEQ value was 2.281 pg-TEQ/L. All samples except one sample showed total-TEQ values below the 1 pg-TEQ/L. HRGC/MS-TEQ values of soil samples was in a range of 0~65.6 pg-TEQ/g (dry) and the highest TEQ value was found in Maseo, where the refinery used to be near. CALUX-TEQs of water samples ranged from 0.7 to 18 pg-TEQ/L and CALUX-TEQs of soil samples ranged from 0.6 to 650 pg-TEQ/g (dry). The correlation between CALUX-TEQs and HRGC/MS-TEQs was very high ($r^2=0.982$). However, the absolute values obtained by CALUX bioassay were always higher than that by HRGC/MS. To interpret this data, the REP values for 17 kinds of dioxin-like compounds were determined by CALUX bioassay. And REP values were compared with WHO-TEF values. The correlation between estimated REP-TEQs and HRGC/MS-TEQs turned out to be very high ($r^2=0.998$) and the absolute values obtained by the analysis of HRGC/MS and estimated based on REP EC50 were appeared to be very similar. And also, there were good correlation ($r^2=0.970$) between estimated REP-TEQs and CALUX-TEQs. However, the absolute TEQ values obtained by CALUX bioassay were always about ten times higher than the estimated REP-TEQ values. Thus, the CALUX bioassay can be highly recommended as an "early warning system" for routine measurement of dioxin-like compounds in environmental matrices.

Keyword : CALUX, dioxin