- Abstract -

A Study on Internationalization of Sampling and Analysis Methods in Workplaces

- an Evaluation of Accuracy and Precision on Low Levels B, T, X Analysis Using Thermal Desorption/Gas Chromatograph/Flame Ionization Detector

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By using thermal desorption/gas chromatograph/flame ionization detector(TD/GC/FID), this study was carried out to evaluate accuracy and precision on low levels(less than 1ppm) Benzene(B), Toluene(T), o-Xylene(X) analysis in an industrial hygiene laboratory.

Limits of detection(LOD) of TD/GC/FID on B, T, X were showed 13.75ng/sample or less. For the accuracy of the method by analytes, the biases were showed 0.9% or less as an absolute value and the coefficients of variance(CV) showed 2.09% or less. Also the accuracy by concentration levels and sorbents(Tenax TA and Chromosorb 106) was evaluated. For the precision on repeatability of peak area and retention time between within-run and between-run of analytical system, It is showed the results of within-run gave better than those of between-run. And the precision on reproducibility between MDHS72 and this study was compared in this paper.

Conclusively LOD of TD/GC/FID was showed a high sensitivity and accuracy and precision on low levels B, T, X analysis using TD/GC/FID were showed good in this study. Therefore it is showed it is possible for TD/GC/FID to evaluate accurately low concentration levels B, T, X of less than 1ppm at indoor or outdoor of workplaces in Korea.

Key Words: thermal desorption, accuracy, precision, bias, coefficient of variance, desorption efficiency, limit of detection, limit of quantity