RESULT FROM THE SECOND ROUND OF THE KOREA CALIBRATION STUDY OF PCDDs/Fs : INCINERATION EXTRACT/ SOIL

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Introduction

Because the results of dioxin analysis are very important and the influences of them are nation-wide and sometimes very critical, in 1998 the Ministry of Environment in Korea starts to give the certification to the laboratory that has the ability and QA/QC program for dioxin sampling and analysis. And since the Analytical Research Center of Environmental Management Corporation won the certification for the first time in 1998, 7 laboratories have been certificated.

Dioxin analysis includes several clean-up steps and instrumental analysis. With the importance of the result, these complexities of dioxin analysis require the finer QA/QC program

As an effort for achieving this, 7 guaranteed laboratories organised Quality Control Council for Dioxin Sampling and Analysis and started to the first round of the Korea Calibration Study of PCDD/F [1]. This time is the second and 6 laboratories were participated in this study (Table 1.).

Table 1. Participants List

Analytical Research Center in Environmental Management Co.
Research Institute of Industrial Science & Technology
Kyonggi-do Institute of Health and Environment
Metropolitan Government Institute of Health and Environment
Korea Testing-Lab. for Industrial Technology
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Material and Methods

The following samples were distributed to the participants: sample A mixed soil, sample B an extract.

For preparing the sample A, three soil samples from the different site are air dried and homogenised respectively, and then mixed. Sample was distributed 30 g each. For preparing the sample B, flue gas

sample from MSWI was extracted with toluene using soxhlet apparatus for 20 hour or more. Sample was distributed 10mL each. The participants used their standard procedures and spiking protocols. All of participants performed sulfuric acid treatment, silica and alumina clean-up and only one performed activated carbon clean-up. 4 participant used SP-2331 GC column and two used DB-5ms GC column. And they reported the 2,3,7,8-substituted PCDD/F. For the calculation of TEQ value, international TEF was used.

Results and Discussion

The results for this study are shown in Table 2. In spite of the low concentration of sample A (average value is 36.2 pg-TEQ/g), there is good agreement. The RSD is only 11 %.

The concentration of sample B is relatively higher (average value is 168.4 pg-TEQ/ample) than the sample A, but it has similar RSD value (10 %).

In conclusion, it can be stated that there is good agreement between the laboratories performing dioxin analysis in Korea. And it is expected that this study will help the laboratories to improve the analytical quality of dioxin analysis.

Table 2. The Result Table of the Second Round of Korea Calibration Study

Participant Code	Sample A (Soil) (pg-TEQ/g)	Sample B (Extract) (pg-TEQ/amp.)
Ko-Cal-3	30.4	182.0
Ko-Cal-5	34.3	145.4
Ko-Cal-6	36.0	162.4
Ko-Cal-7	42.1	155.3
Ko-Cal-8	39.1	172.2
Ko-Cal-9	35.2	193.1
Average	36.2	168.4
Median	35.6	167.3
Max.	42.1	193.1
Min.	30.4	145.4
Standard Diviation	4.1	17.6
RSD(%)	11.2	10.4

References

1. Result from the first Round of the Korea-Interlab Calibration Study of PCDDs, PCDFs : Incineration : C. H. Joo, S. W. Eom, S. C. Kim, S. K. Jang, J. C. You. Organohalogen Compounds. 40 (1999) 313-316