

## SPECTROPHOTOMETRIC ANALYSIS

## No. A259

## Determination of Metal Elements in Organic Solvents by Electrothermal Atomization Atomic Absorption Spectrometry

When analysis of trace metals in organic solvents is carried out by electrothermal atomic absorption spectrometry, favorable results may not be obtained sometimes by the same method as used for trace metal analysis in an aqueous solution.

This is partly due to the fact that in the analysis by electrothermal absorption spectrometry, sensitivity for organic metal compounds differs from that for inorganic compounds. For this reason, standard substance of organic metal compounds needs to be added to the standard solution in the case of analysis

for organic metal compounds contained in a sample. Furthermore, in the case the metal of interest contained in a sample is an organic metal compounds, as there is the possibility that it evaporates at low temperature, an appropriate interference inhibitor needs to be added for preventing the deterioration of sensitivity due to evaporation of the target metal in the process of ashing.

Introduced in this article are examples of determination of lead and arsenic in naphtha and copper in oil.

### ■ Determination of Pb in Naphtha

An example of determination of Pb in naphtha is shown in Fig. 1.

Using 4-cyclohexyl lead butylate dissolved in tetrahydrofuran (THF) as a standard solution, determination of Pb in naphtha was carried out by calibration curve method. Iodine was added to every

sample solution in such a way that its concentration would be 1000ppm. Naphtha was diluted 2 times and 1000 ppm of iodine was added. As the concentration of Pb in the sample was a bit too high, sensitivity was lowered in the determination.

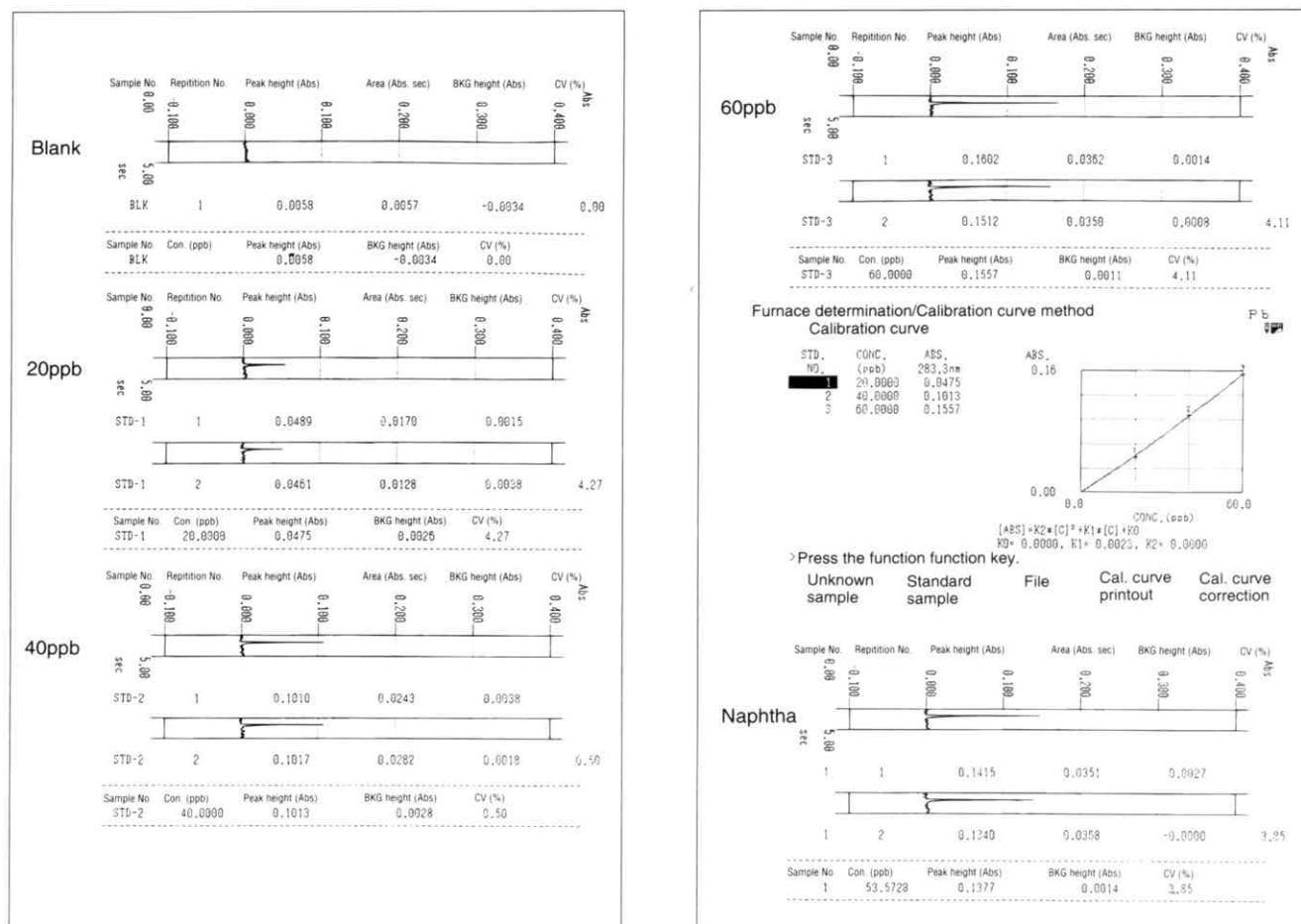
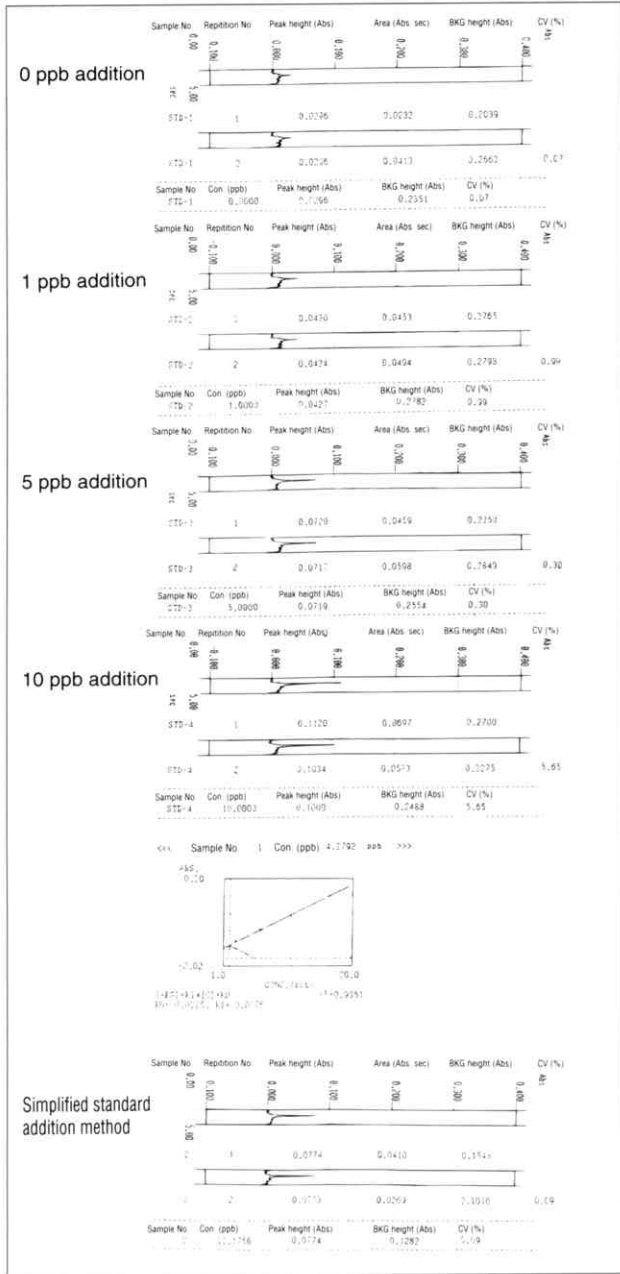


Fig.1 Determination of Pb in Naphtha

**■ Determination of As in Naphtha**

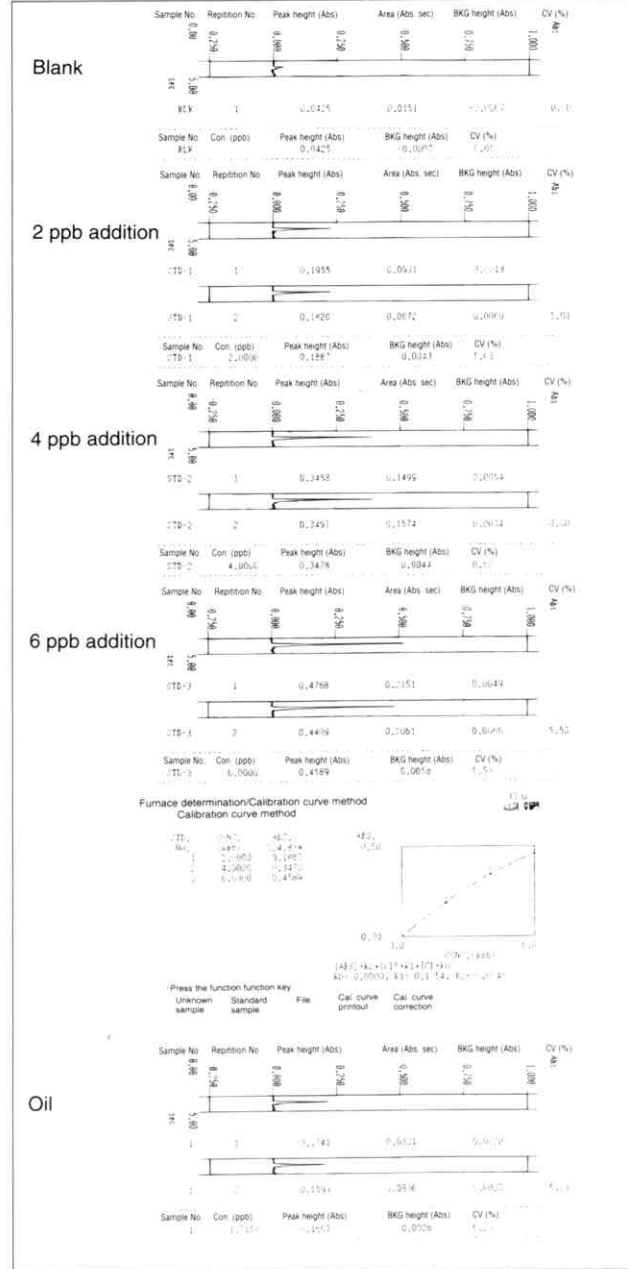
Fig.2 shows determination of As in naphtha. Naphtha was diluted two times by THF, to which a standard solution of As was added, and analysis was carried out by standard addition method. For analysis, 10 μl of 100 ppm of vanadium nitrate per 20 μl of the sample was added as interference inhibitor. Then, using the obtained calibration curve, another naphtha sample was quantitated by the simplified standard addition method.



**Fig.2 Determination of As in Naphtha**

**■ Determination of Cu in Oil**

Fig.3 shows determination of Cu in oil. Using a standard oil solution of CONOSTAN diluted with THF as a standard solution, determination was carried out with calibration curve method. A sample diluted 5 times with THF was used for the analysis. In the analysis, 4 μl of 100 ppm of vanadium nitrate per 20 μl of the sample was injected.



**Fig.3 Determination of Cu in Oil**

