

SPECTROPHOTOMETRIC ANALYSIS 179

Composition analysis of thin film by atomic absorption analysis

— Determination of indium, antimony, tellurium —

Along with the advancements in thin film technology, the industrial uses of thin films continue to expand, and therefore the thin film forming methods, composition analysis, thickness measurements, and two- or three-dimensional concentration distribution analyses are regarded with greater importance.

In the composition analysis of thin films, in order to understand the composition accurately, it is necessary to consider the solvation of the thin film sample for measurement in solution form. A thin film sample in a solution form has only traces of elements, and the number of components is small. However, since the existing elements are known, it is suited to atomic absorption analysis. Depending on the element concentration in the solution of the thin film sample, either the flame atomic

absorption method or flameless atomic absorption method may be used, and the composition may be determined easily.

In the present experiment, a thin film of indium, antimony and tellurium was formed on a quartz glass plate of 10 × 10 mm in ultrahigh vacuum. The thin film portion was dissolved in aqua regia, and the atomic absorption analysis was performed.

As examples of measurement of elements, the indium measurement data by flame atomic absorption method is given in Fig. 1, the indium measurement data by flameless atomic absorption method in Fig. 2, and antimony and tellurium measurement data by flame atomic absorption method in Figs. 3 and 4, respectively.

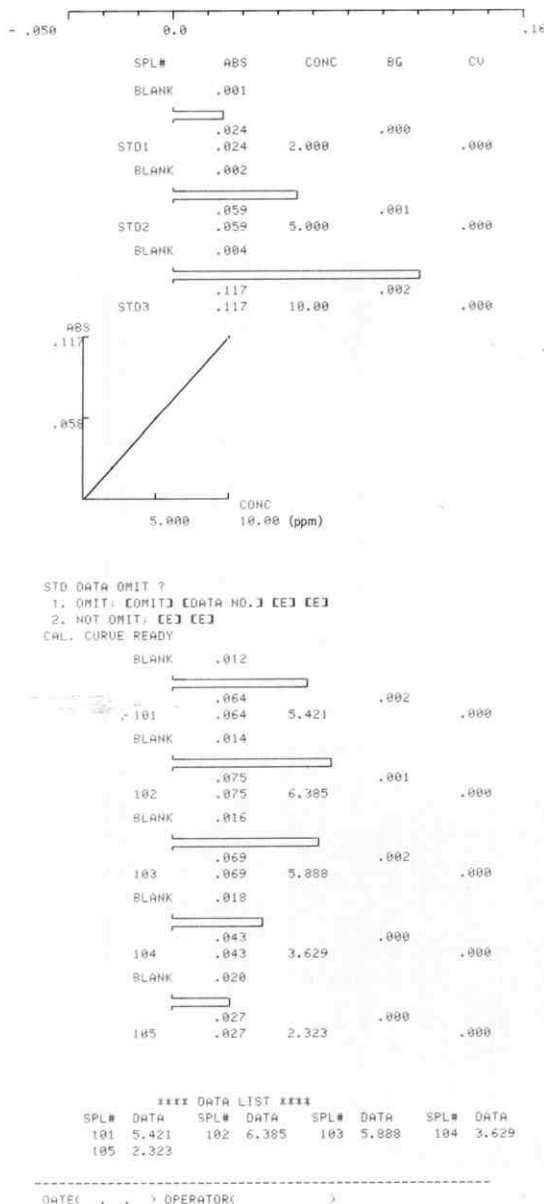


Fig. 1 Measurement Data for Indium by Flame Atomic Absorption Method

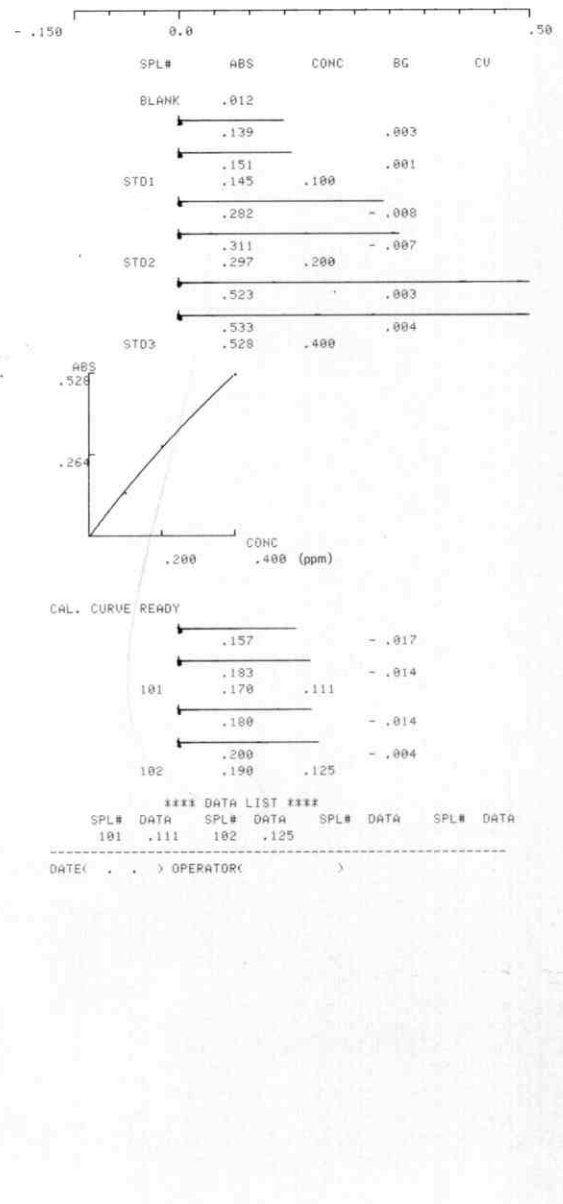


Fig. 2 Measurement Data for Indium by Flameless Atomic Absorption Method

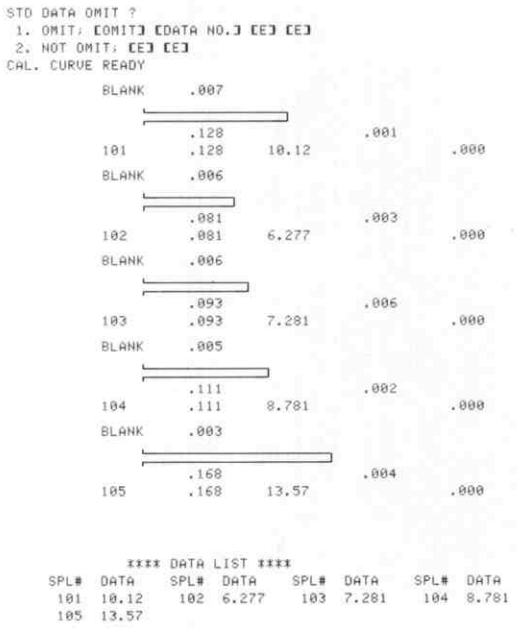
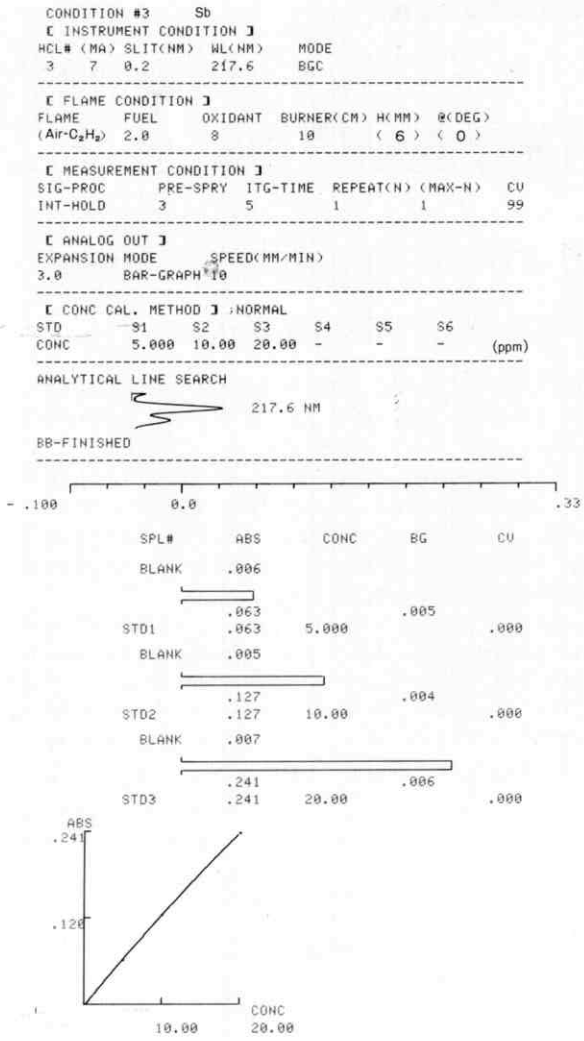


Fig. 3 Measurement Data for Antimony by Flame Atomic Absorption Method

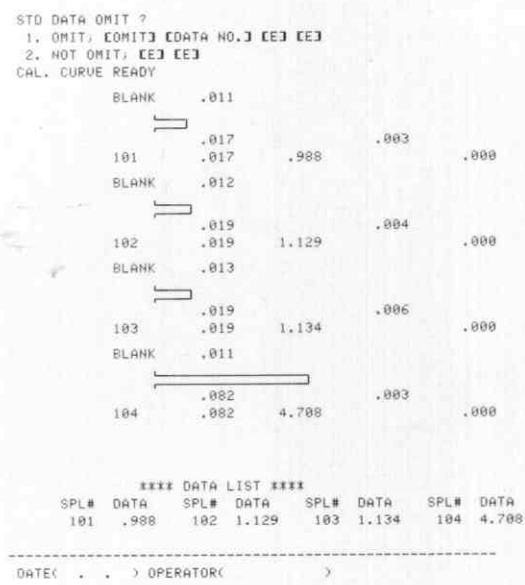
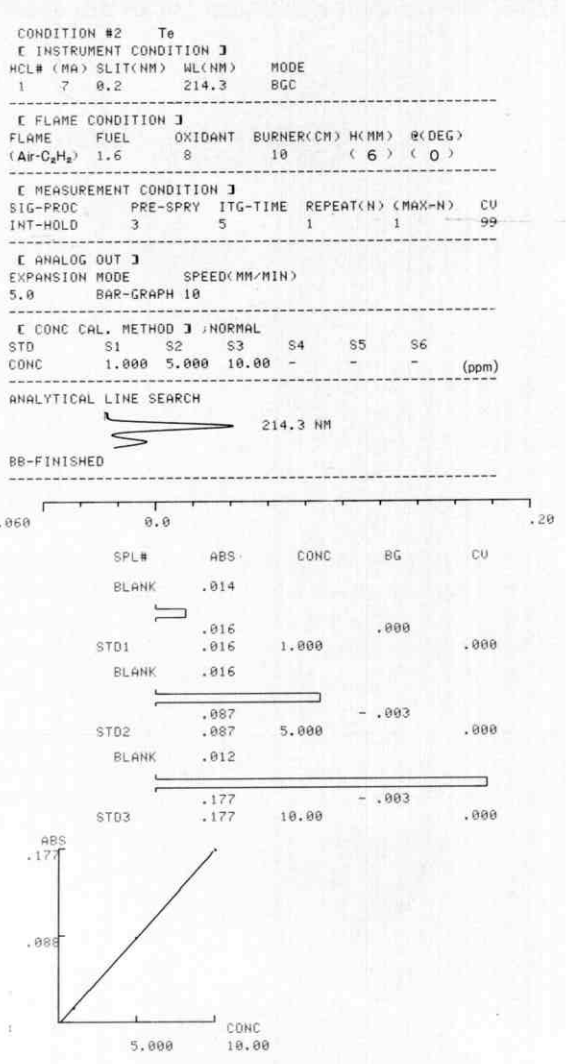


Fig. 4 Measurement Data for Tellurium by Flame Atomic Absorption Method



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