

SPECTROPHOTOMETRIC ANALYSIS No. A230

Determination of Phosphorus, Lead and Zinc in Water by Atomic and UV-VIS Absorption Spectrophotometry

As the number of substances that pollute our water resources grows with our knowledge, the problems of establishing and maintaining water quality tend to become complex. In particular, the availability of clean tap water is essential to our daily life, and the control of that water quality is very important for maintaining our health. Accordingly, the quality standards and analytical methods for harmful substances in source water and tap water are specified in the water quality laws and drinking water test-

ing methods of the developed nations. For the determination of the harmful title elements, the flame atomic absorption method, flameless atomic absorption method, and absorption photometry are employed.

Shown here are examples of the determinations of phosphorus using the UV-2200 spectrophotometer, lead by AA-680G flameless atomic absorption spectrophotometer and zinc by AA-680 flame atomic absorption spectrophotometer.

■ Determination of Phosphorus

To 50 ml of river water, add ammonium molybdenate solution to produce phosphomolybdic acid. Then add ascorbic acid as a reducer, and measure the absorbance of the obtained molybdenum blue by spectrophotometer at wavelength of 870 nm to indirectly determine the phosphorus.

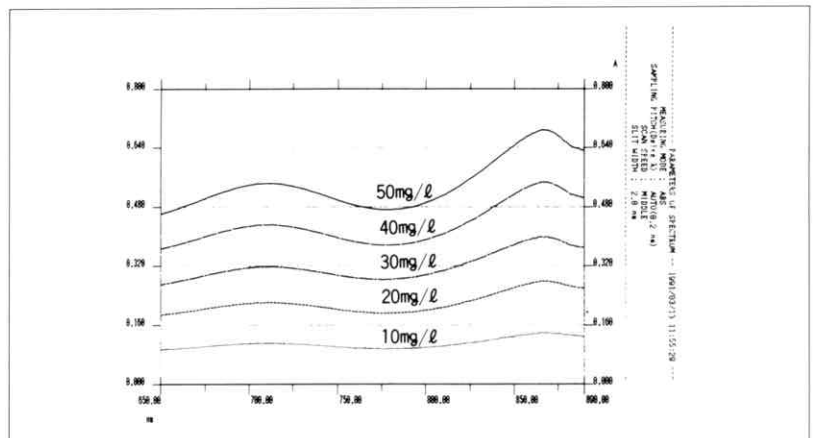


Fig. 1 Spectra of Phosphorus Standard Solutions

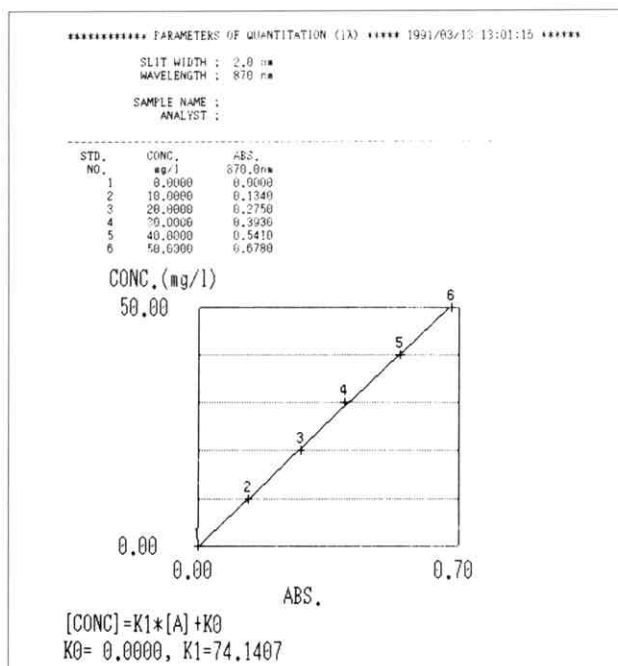


Fig. 2 Absorbance Data and Calibration Curve for Phosphorus Standards

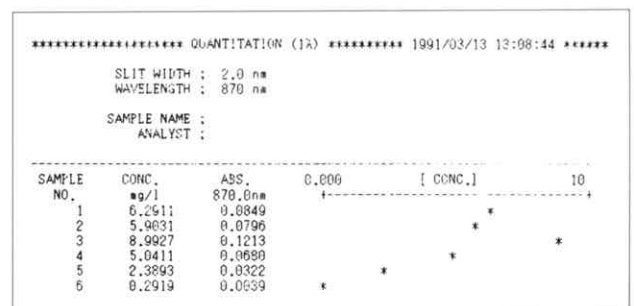


Fig. 3 Quantitation Result for Phosphorus in River Water

■ Determination of Zinc

To 200 ml of groundwater, add 2ml of nitric acid, heat and concentrate to a whole volume of 20ml, and determine the zinc by flame atomic absorption spectrophotometer.

■ Determination of Lead

To 100 ml each of city water and groundwater, add 1 ml of nitric acid, and inject 20 μl of the solution into the graphite furnace to determine the lead by flameless atomic absorption spectrophotometer.

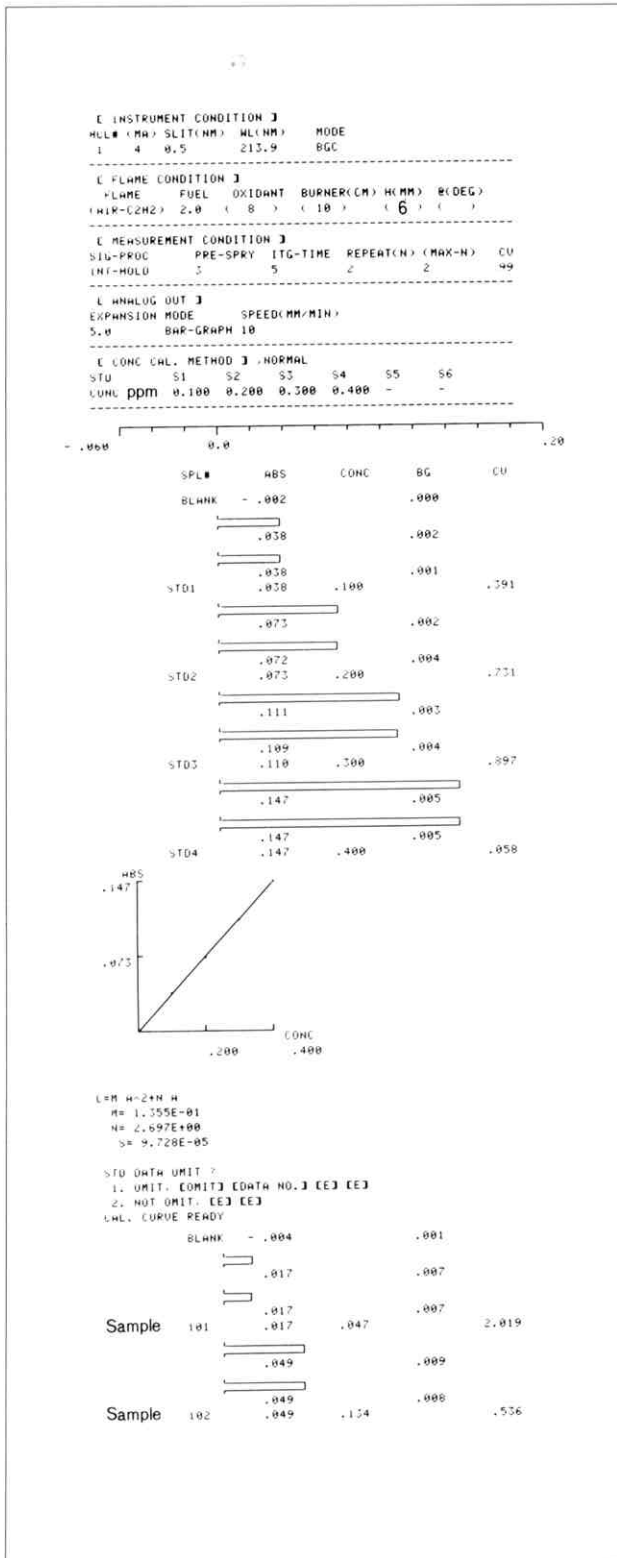


Fig. 4 Example of Zinc Determination in Groundwater

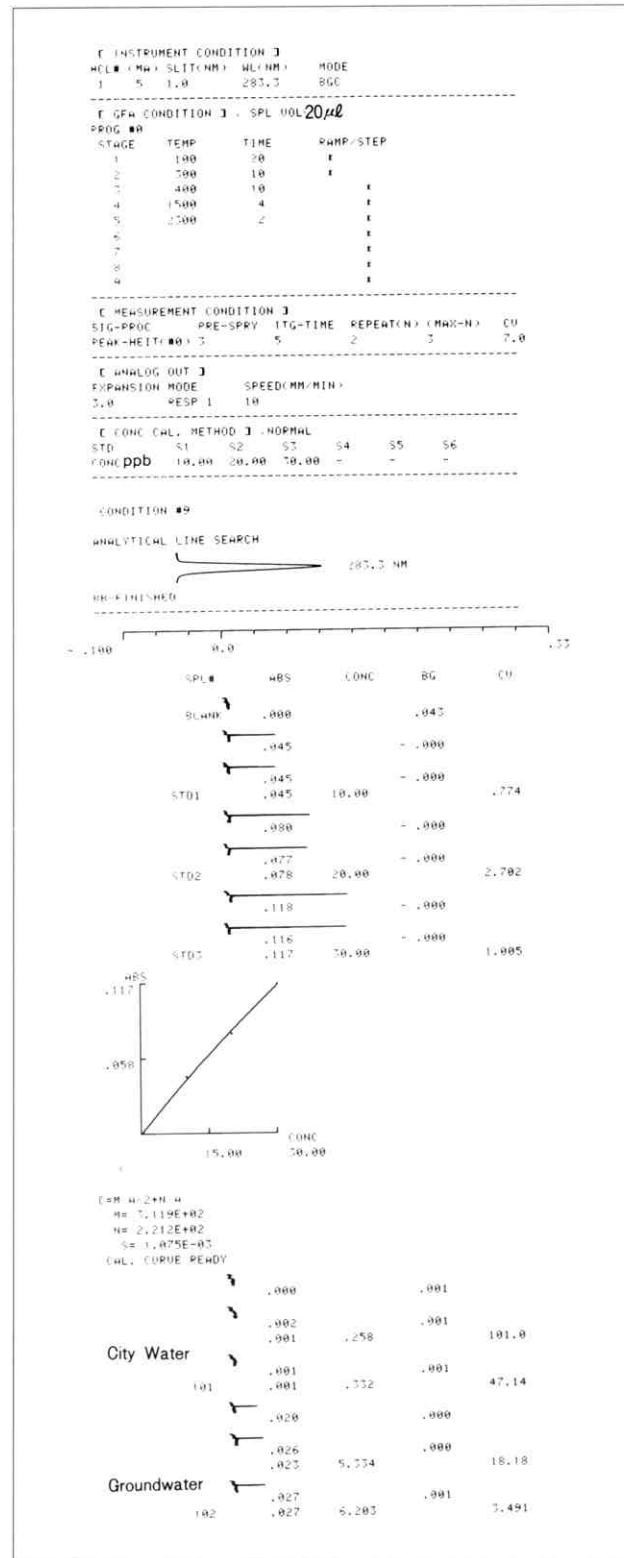


Fig. 5 Example of Lead Determination in City Water and Groundwater

