

# **Assessment of closed vessel digestion methods for elemental determination of airborne particulate matter by ICP-AES**

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摘要.

## **Abstract**

Closed vessel acid digestion methods, especially the microwave digestion, have been investigated for elemental analysis of airborne particulates collected by glass fiber filter and analyzed by ICP-AES. A two-step digestion procedure was examined; it included the digestion of airborne particulates with HNO<sub>3</sub>+HClO<sub>4</sub> in the first step and the addition of HF after removal from the intact filter membrane in the second step. Both the NIST Standard Reference Material 1648 urban particulate matter and real samples were employed to assess the capabilities of the suggested methods throughout the QA/QC programs. It was found that the two-step method is an appropriate pretreatment procedure for multi-element analysis by ICP-AES. The importance of evaporation after the digestion and of the substitution of H<sub>3</sub>BO<sub>3</sub> addition for evaporation process are discussed. Both evaporation and H<sub>3</sub>BO<sub>3</sub> addition processes after the digestion may effectively reduce the matrix effect on the suppression of the analyte elements. A comparison between the conventional pressure bomb and microwave digestion methods was performed using real samples.