

Quantitative analysis of untreated oil samples in in-air PIXE

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Abstract

The method of quantitative analysis of oil samples in in-air PIXE has been developed on the basis of the standard-free method. The components of the continuous X-rays originated from air and a backing film can be exactly subtracted by normalizing with the yields of Ar K- α X-ray peak. The method was developed using three kinds of standard oil samples and its accuracy and reproducibility were confirmed by comparing the results with those obtained by the internal-standard method using single-element standard oils. Validity of the method for practical oil samples was confirmed by applying the method to various kinds of oils such as engine, machine and a few kinds of edible oils. It was confirmed that the method is valid in a case where arbitral element is designated as an index element depending on the composition of the oil sample. Moreover, targets can be prepared by anyone within ten seconds only by putting a drop of oils onto a backing film. It is expected that the method will become a powerful tool for the studies in atmospheric environmental sciences

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