

Preparation of liquid samples using nanoimprint film and quantitative analysis of mineral component by fundamental parameter method.

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The concentration method is widely used for sample preparation of minerals in drinking water by quantitative X-ray fluorescence spectrometry. In this method, a liquid sample is dropped on accessories (i.e. membrane filter and polymer film), and then mineral components are deposited by drying. However, mineral components are segregated on surface and inside of the filter, and deposits are crystallized in the polymer film. Therefore, it is difficult to establish a homogeneous state. These are particular problem for light element analysis. Also, in the quantitative analysis, it is necessary to prepare the standard samples depending on the concentration of measurement sample and to prepare the calibration curves using them, so that quickness lacked.

To solve the above mentioned problems, we investigated the sample preparation method using a nanoimprint film with microstructure (figure 1) and the method of calculating the content from the deposition amount of each element calculated by thin film fundamental parameter method (thin-film FP method). It was found that the sample preparation method using the nanoimprint film stably thinned and homogenized the deposits of minerals and had higher sample preparation reproducibility than the conventional method. In addition, it was confirmed that certain quantification accuracy can be obtained by quantitative analysis combining this sample preparation method and thin-film FP method.

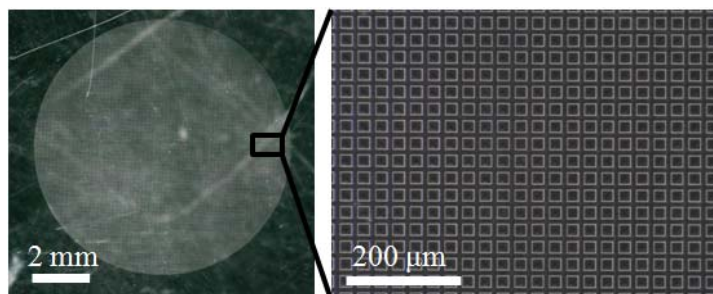


Figure 1. Appearance of nanoimprint film.