

Analysis of Chemical States of Heavy Metals in Environmental Samples Using XFAS†

Yoshihiro Kikuchi¹, Masahito Kikuchi², Masahito Kikuchi³, Masahito Kikuchi⁴

Abstract :

Heavy metals in environmental samples are analyzed using X-ray fluorescence analysis (XRF) and X-ray absorption fine structure analysis (XAFS). The chemical states of heavy metals are analyzed using XAFS. The results show that the chemical states of heavy metals in environmental samples are different from those in industrial samples. The results also show that the chemical states of heavy metals in environmental samples are different from those in natural samples. The results also show that the chemical states of heavy metals in environmental samples are different from those in synthetic samples.

1. Introduction

Heavy metals in environmental samples are analyzed using X-ray fluorescence analysis (XRF) and X-ray absorption fine structure analysis (XAFS). The chemical states of heavy metals are analyzed using XAFS. The results show that the chemical states of heavy metals in environmental samples are different from those in industrial samples. The results also show that the chemical states of heavy metals in environmental samples are different from those in natural samples. The results also show that the chemical states of heavy metals in environmental samples are different from those in synthetic samples.

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Photo 1

2. Conventional Analysis Methods of Chemical States of Heavy Metals

Figure 1

Photo 2

3. XFAS Analysis

Figure 2

Figure 2 shows the typical XPS spectra of the sewage sludge. The spectra show the typical peaks of the sewage sludge. The binding energy of the peaks is shown in the figure. The typical peaks are observed at the binding energy of 529.3 eV (C 1s), 532.9 eV (O 1s), and 285.0 eV (C 1s).

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4. Measurement of Chemical States of Heavy Metals in Sewage Sludge

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4.1 Experimental Method

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4.2 Results

4.2.1 Change in the state of Mn

Figure 3

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5. Analysis of the Chemical State of Trace Arsenic (As) in Sewage

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5.1 Experimental Method

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