



# Lead in Ash

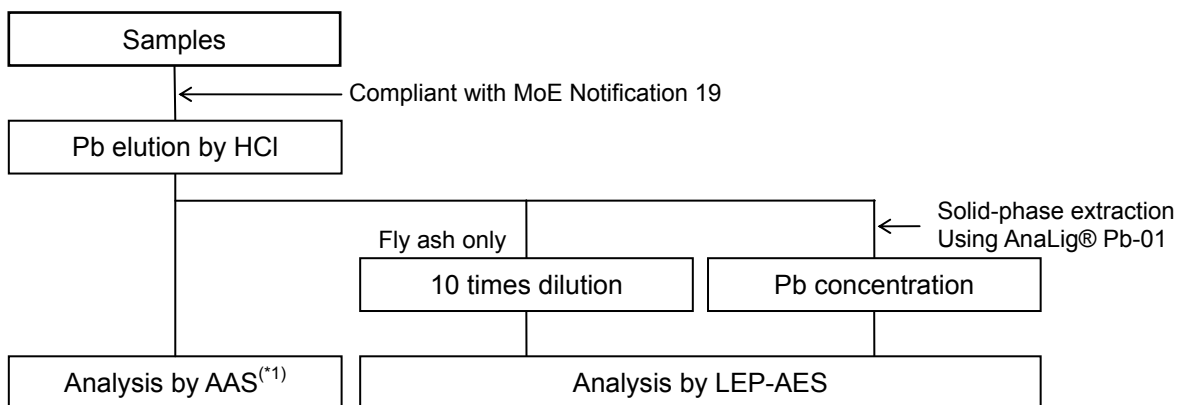
## Qualitative analysis

For examination of after-treatment of various kind of ashes, it depends on the values of Elution amount test (the Ministry of Environment, Notification 18, 2003) and Content amount test (MoE, Notification 19, 2003) of toxic metals, required by Soil Contamination Countermeasures Act, to select among some alternatives.

By using an ultra compact atomic emission elemental analyzer, following a principle of Liquid Electrode Plasma-Atomic Emission Spectrometry (LEP-AES), Pb contained with sample of various kinds of ashes was determined quantity. It reveals a correlation by comparison with flame atomic absorption spectroscopy (AAS), one of official methods. It was confirmed that LEP-AES is available to measure Pb contained with sample of various kinds of ashes on site, quickly.

**Samples:** Bottom ash, incineration ash, fly ash

### Outline of processing:



(\*1) analyzed by Industrial Research Institute of Ishikawa

### Results:

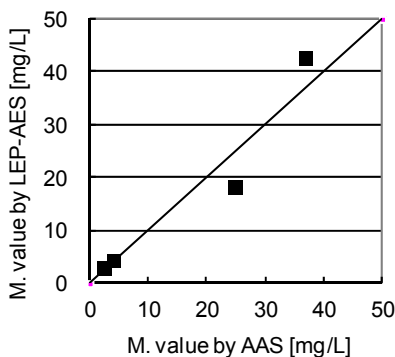


Fig. 1 Bottom ash

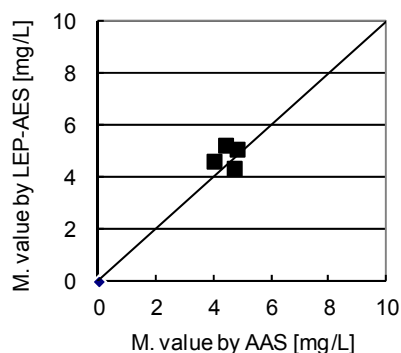


Fig. 2 Incineration ash

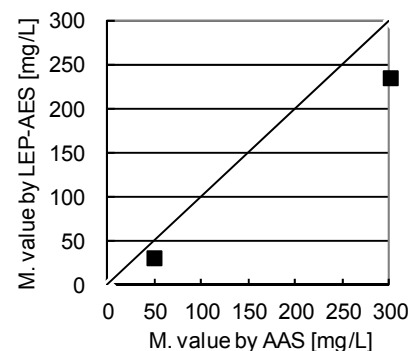
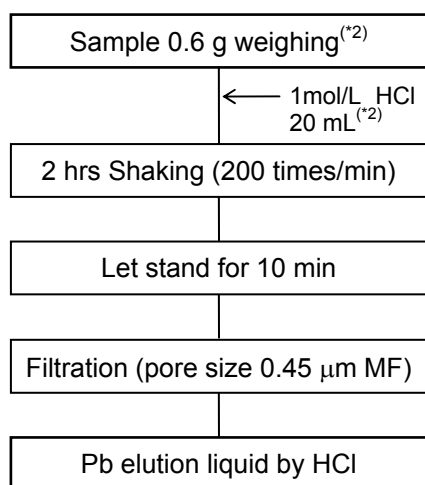


Fig. 3 Fly ash

It revealed good correlativity of both in wide range from incineration ash that eluted a little Pb to fly ash that eluted a lot of Pb. As above, it was shown that Pb contained with sample of various kinds of ashes was measured easily and quickly by using LEP-AES.

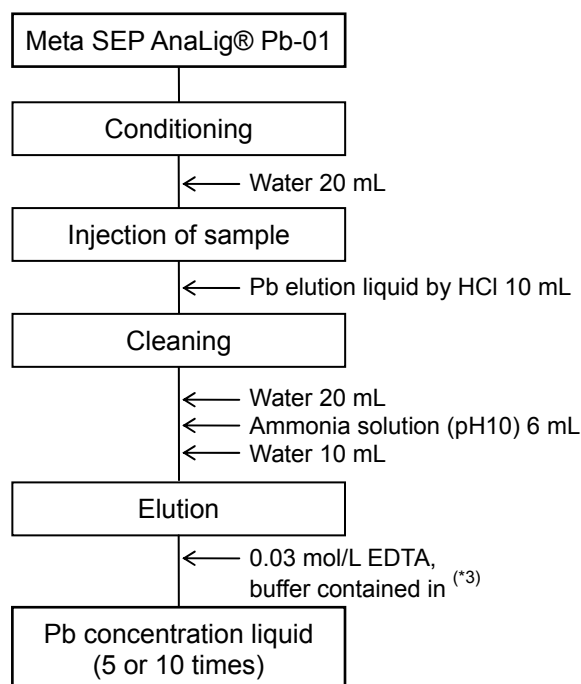
**Supplement 1: Pretreatment**

1. Elution of Pb from sample  
(Compliant with MoE Notification 19)



(\*2) Both sample and HCl are measured 1/10 for the volume specified by Notification 19

2. Solid-phase extraction (Separation/Concentration)



(\*3) 0.88 g Ethylenediaminetetraacetic acid and 6 mL buffer solution (pH10)<sup>(\*4)</sup> diluted by water and made into 100 mL.

(\*4) Buffer solution (pH10) and 67.7 g ammonium chloride diluted in 26.4% ammonia solution 572 mL.

**Supplement 2: LEP-AES analysis condition**

Instrument:	MH-5000 s2086
Emission cuvette:	LepiCuve-02
Applied voltage:	800 V (0.1 mol/L HCl) 1000 V (Pb-01 elution)
Pulse(number of times):	10 pulse
ON time per 1 pulse:	3 ms
OFF time per 1 pulse:	2 ms



Length 204 mm  
Width 105 mm  
Height 114 mm  
Weight 1.4 kg

Fig.4 Ultra compact elemental analyzer MH-5000

**Supplement 3: Calibration curve**

At first, Pb standard solution was diluted. Then it was concentrated 10 times by using Meta SEP AnaLig® Pb-01. It shows to the right a calibration curve of concentrated liquid. The high linearity was confirmed.

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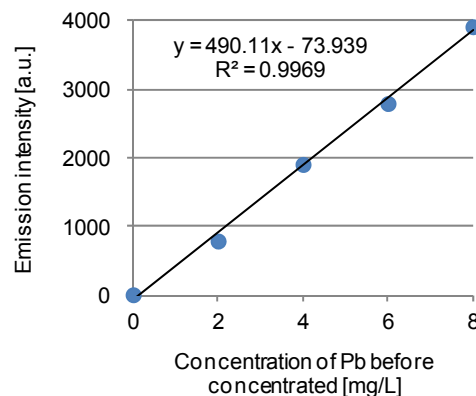


Fig. 5 Calibration curve of Pb concentrated liquid