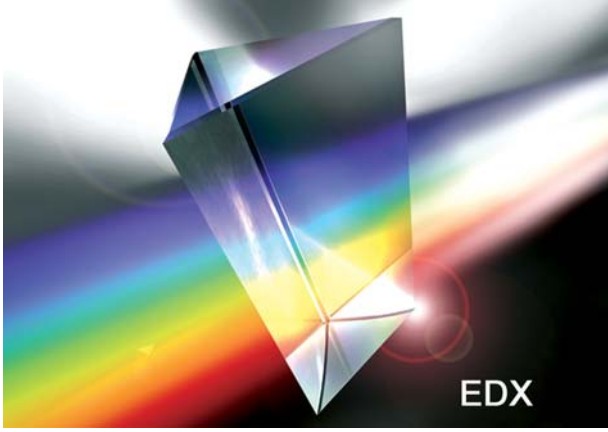
Application Note

EDXRF Analysis of Incinerated Ash



EDXRF Analysis of Incinerated Ash

The use of XRF measurement is expanding in the environmental and recycling fields more and more. One is content control of Calcium oxide, silica and alumina which are main constituents of the incinerated ash, and then this ash is used recycling such as cement material, building materials. Tow is check of Chlorine. Three is exist or not of harmful heavy elements such as lead. This report describes the Qual-Quan analysis of incinerated ash and empirical correction method which is useful for precious quantification of trace elements.

<Qualitative-Quantitative Analysis of Incinerated Ash>

- Sample Preparation

5um polypropylene was stuck onto the base of powder sample receptacle into which approximately 3g of the sample was put without any preparation.

- Result of Qualitative and Quantitative Analysis

Fig.1 shows qualitative analysis results and quantitative values obtained by the FP method for incinerated ash. Chlorine and heavy elements of small contents are detected and quantified easily. These constituents were assumed as oxide.

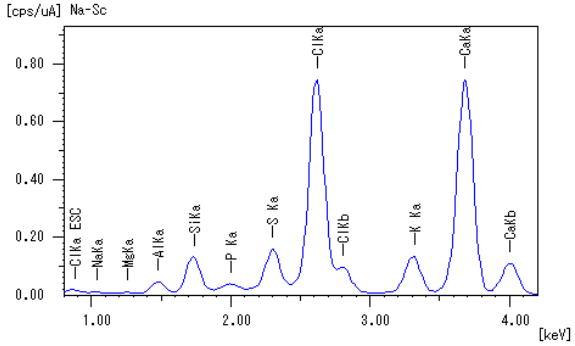


Fig.1 (b) Na-Sc Qualitative Result

Analyte	Result	
CaO	37.552	%
Cl	17.870	%
SiO2	11.299	%
Na2O	7.789	%
K2O	6.894	%
Al2O3	6.265	%
SO3	5.618	%
MgO	1.922	%
TiO2	1.512	%
P2O5	1.432	%
Fe2O3	0.842	%
ZnO	0.450	%
PbO	0.124	%
MnO	0.080	%
Sb2O3	0.070	%
Cr2O3	0.067	%
CuO	0.063	%
SnO2	0.059	%
Br	0.055	%
SrO	0.038	%

Fig.1 (c) Quantitative Result

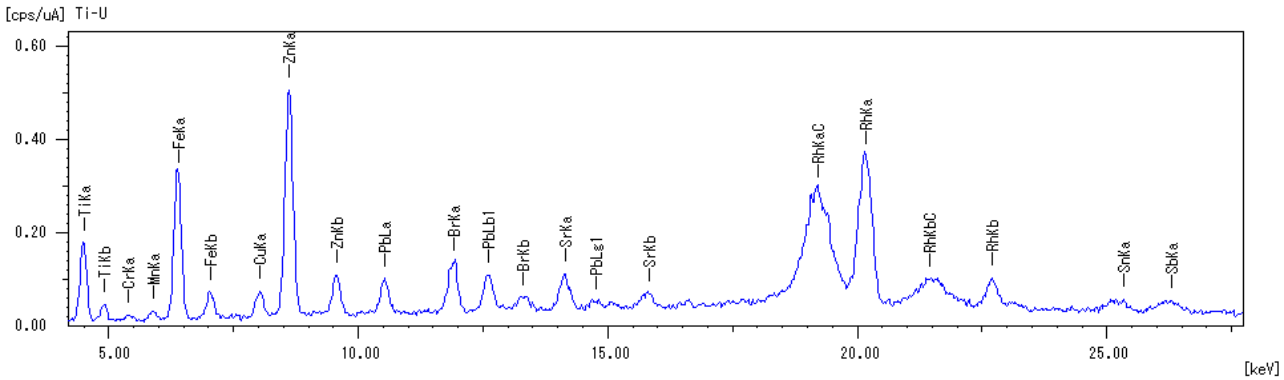


Fig.1 (a) Ti-U Qualitative Result

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<Calibration Curve of Trace Elements>

■ Sample

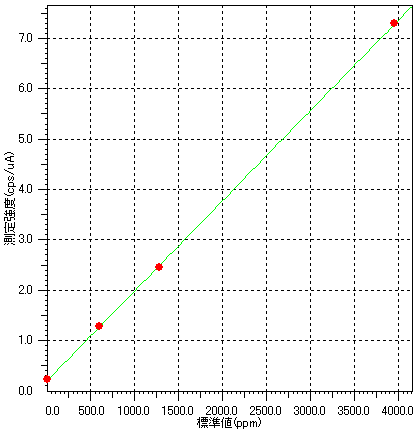
The compounds are what standard solutions of AA were dropped on the reagent SiO_2 powder. These were dried and mixed homogeneously.

■ Sample Preparation

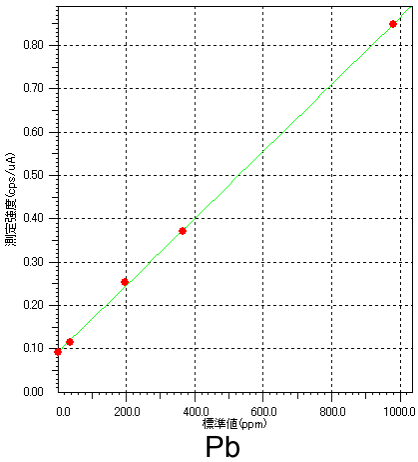
5 µm polypropylene was stuck onto the base of powder sample receptacle into which approximately 3g of the sample was put without any preparation.

■ Calibration Curve

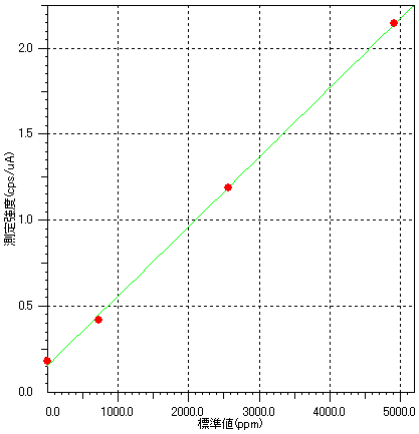
The calibration curves of Pb, Zn and Cu are shown in Fig.2. Then Lower Limits of Detection(L.L.D) and accuracy calculated from them are shown in Table 2.



Zn



Pb



Cu

Fig. 2 Calibration Curves

Table 1 Calibration Curve

Element	Pb	Zn	Cu
Range	0 - 1000	0 - 4000	0 - 5000
Accuracy	7.0	22	60
Lower Limit of Detection	31	25	22

■ Analytical Conditions

<Qualitative Analysis>

Instrument:	EDX-700
X-ray Tube:	Rh target
Voltage - Current:	50 kV-(Auto) 15 kV-(Auto)
Atmosphere:	Vacuum
Measurement:	10 mmφ
Diameter:	100 sec
Measurement Time:	25 %
Dead Time:	

<Empirical Correction Analysis>

Instrument:	EDX-700
X-ray Tube:	Rh target
Voltage - Current:	50 kV-(Auto)
Filter:	Ni,Ti
Atmosphere:	Vaccum
Measurement:	10 mmφ
Diameter:	100 sec
Measurement Time:	25 %
Dead Time:	