

Application Note

EDXRF Analysis of Glass



Since EDX can analyze a sample regardless of its size or shape, irregular objects such as glass bottles or their broken pieces and laser disc plates can be easily analyzed. In addition, trace elements in glass can be detected using a Zr filter. Shown below are examples of qualitative and quantitative analysis of borosilicate glass and qualitative analysis of trace elements within special glass.

Sample

1. NBS standard sample 93a
Borosilicate glass.
2. Special glass A, B

Sample Preparation

The sample was placed directly on the sample stage.

Result of the Qualitative and Quantitative Analysis of Borosilicate Glass

The result of the qualitative analysis is shown in Fig.1. The graph on the bottom right superimposes the results with and without the Al filter, through which the presence of Cl was detected.

The quantitative analysis results by the FP method is shown in Table 1. The quantitative calculations were made by employing the standard value as the fixed value because Boron cannot be detected.

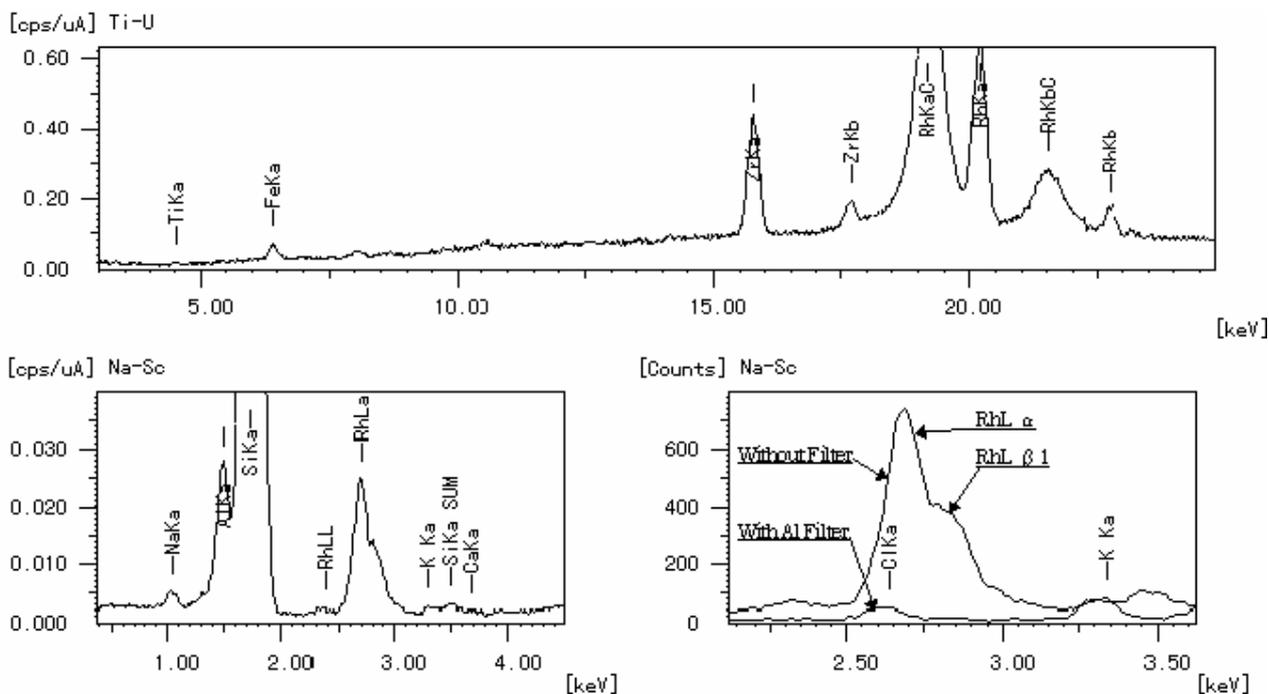


Fig.1 Qualitative Analysis of Borosilicate Glass NBS93a

Table 1 Quantitative Value of Borosilicate Glass NBS93a by FP Method

Compound	SiO ₂	Na ₂ O	Al ₂ O ₃	Cl	ZrO ₂	Fe ₂ O ₃	K ₂ O	CaO	TiO ₂	B ₂ O ₃
Quantitative Value(%)	80.80	3.43	2.93	0.086	0.054	0.040	0.039	0.036	0.027	(12.56)
Standard Value(%)	80.8	3.98	2.28	0.060	0.042	0.044	0.014	0.01	0.014	12.56

() known value

Qualitative Analysis of Trace Elements in Special Glass using the Zr Filter

By using the filter effectively, the scattering of the primary X-rays from the X-ray tube can be reduced, and a good S/N ratio can be achieved during measurement. In Fig.2 the

qualitative analysis results of trace elements for the two types of special glass are shown, with the results obtained using Zr filter superimposed on the results obtained without the filter.

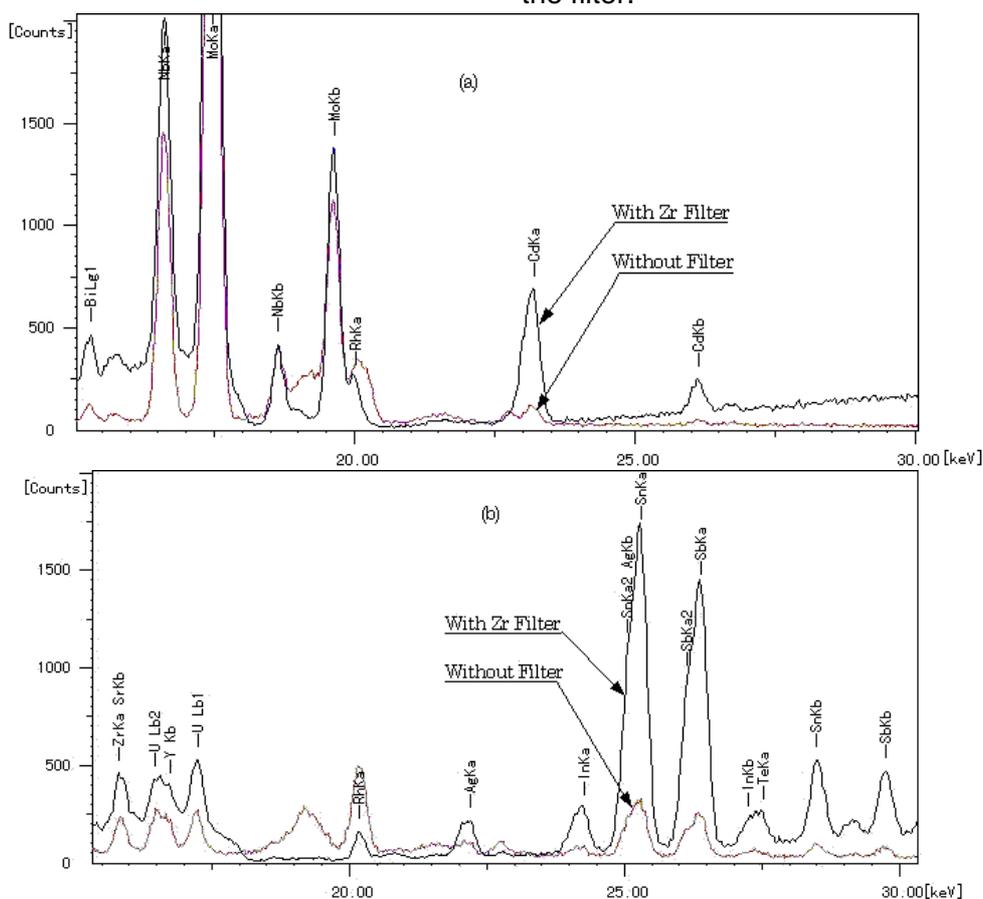


Fig.2 Qualitative Analysis of Traces in Glasses using Zr Filter (a)Glass A (b)Glass B

Analytical Conditions

Instrument: EDX-700
 X-ray Tube: Rh target
 Filter: not used, Al, Zr
 Voltage - Current : 50kV-9-202μA(Auto)
 15kV-182-1000μA(Auto)

Atmosphere: Vacuum
 Measurement Diameter: 10 mm
 Measuring Time: 300 sec
 Dead Time : 24-27 %

The given specifications serve purely as technical information for the user. No guarantee is given on technical specification of the described product and/or procedures.