

IN FOCUS

glass analysis

X-ray fluorescence

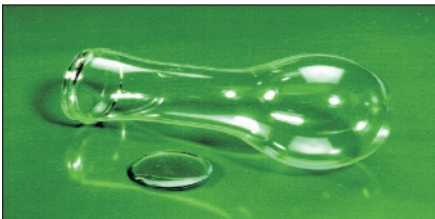
composition

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Determination of the composition of glass with X-ray fluorescence

**Method Description**

In X-ray fluorescence analysis a sample is irradiated by an X-ray beam which results in the ejection of inner shell electrons from the sample atoms. Outer shell electrons take their place and the difference in energy level is released in the form of fluorescent X-rays. The wavelength of this secondary radiation is characteristic for each element present and the intensities are related to the elemental composition of the sample. Quantification is generally done with well-known reference materials.

Measured Quantity

X-Ray counts.

Derived Quantity

Weight percentage of elements.

Measuring Range

Elements: F-U.
Detection limit: 10-1000 µg/g.

Precision

Precision in XRF is element and sample dependent and can be tuned to high values.

Under standard conditions the following values are common practice.

Major elements: >10 weight % rsd <0.5%.

Minor elements: 1-10 weight % rsd <1%.

Low elements: 0.05-1 weight % rsd <10%.

Accuracy

Depends on the accuracy of the reference materials. An accuracy better than 1% with respect to the reference materials is obtainable.

Possible Errors

Instrumental errors and sample preparation errors generally are small. Quantification errors will occur if no appropriate reference materials are available.

Sampling

5 gram material should be available. Special attention should be paid to the fact that the sample is representative for the batch.

Calibration

Against reference materials.

Measuring Time

0.5 day.

Cost Aspect

1 man hour depending on the required precision.