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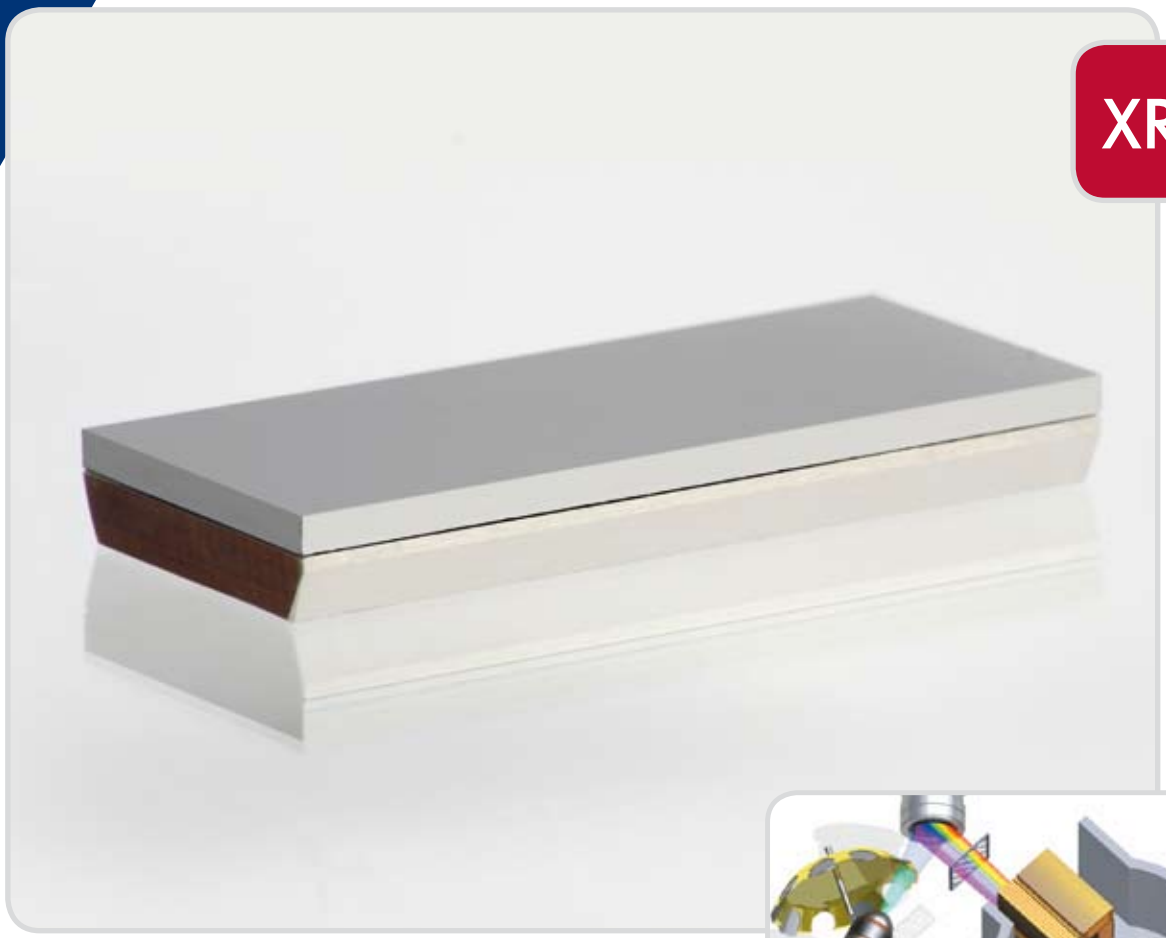
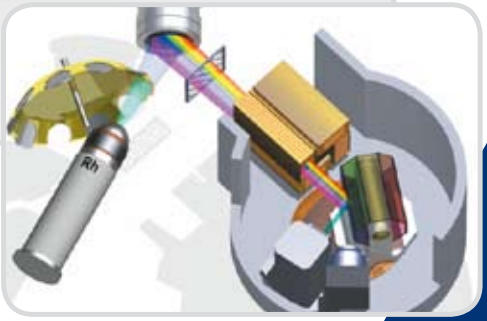
XRF Analyzer Crystals

Optics for X-ray Fluorescence Spectrometry

XRF





- Mirrors for XRF, TXRF and EPMA
- Energy range: 0.1 - 2.3 keV
- Lower limits of detection for light elements
- Analysis of beryllium, boron and carbon with a 30 % improvement at a quicker rate
- Special mirrors custom-made

XRF Upgrade your XRF machine

www.incoatec.de

XRF Analyzer Crystals: Optics for X-ray Fluorescence Spectrometry

Incoatec produces optics for X-ray Fluorescence devices. As analyzer crystals they select the required wavelength of the fluorescence radiation emitted by the sample. The optics, comprising of thin film multilayers, are used for analyzing light elements such as Be, B, C, N up to S. The energy of the fluorescence radiation is filtered by the multilayers up to 2.3 keV. Our optics are for example used in XRF spectrometers made by Bruker AXS.

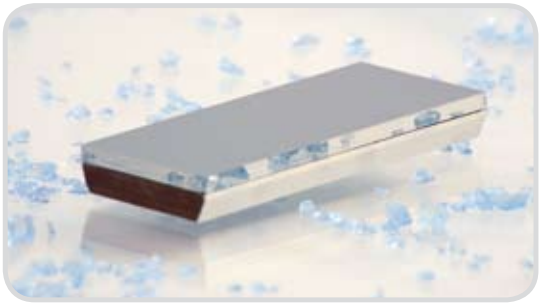


Figure 1 shows the XRF measurement of boron radiation using both our analyzer crystal and the former crystal. With the development of a new type of multilayer we achieved an increase in the count rate of 50%. The calculated lower limit of detection (LLD) is reduced by 30%. Our know-how in the field of material research and deposition technology was the key factor for this exciting development. We hold numerous patents for boron and carbon analyzer crystals (Pat. US 6628748, DE 10134266 to name but a few).

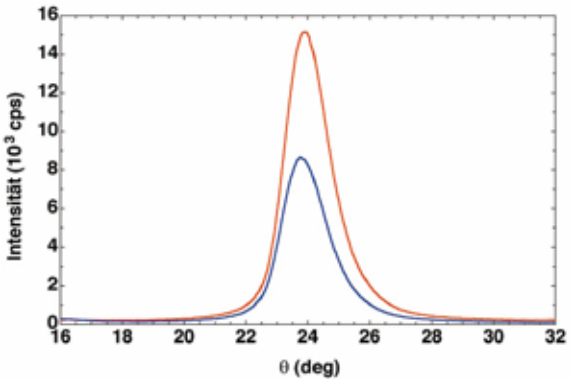


Fig. 1: Comparison of XRF measurements for boron using our XS-B (red) and a former analyzer crystal (blue).

The analyzer crystals enable a distinct improvement in the lower limit of detection. Table 1 shows results of measurements with our analyzer crystals in XRF spectrometers which are available commercially. The LLD values for light elements are calculated on the basis of typical calibration curves which were achieved by measuring different concentrations of the elements in similar kinds of samples.

Element	Sample	LLD (ppm)
Be	< 4% in Cu-bronze	685
B	< 4% in boron-phosphorus glasses	220
B	< 15% in colemanitis	185
C	< 5% in cast iron	76

Tab. 1: LLD values for light elements using our analyzer crystals. The measurements were taken within 100 s at 4 kW.

Our latest development, the XS-CEM analyzer crystal, is especially designed for applications in the cement industry (Tab. 2). It has a higher resolution and a reflectivity comparable to the PET. The main advantage of the XS-CEM is that its performance is not dependent on the temperature within the spectrometer. The PET is no longer required for many types of applications!

Elements / Analyzers	Be	B	C	N	O	F	Ne	Na	Mg	Al	Si	P	S
XS-B	x	x											
XS-C			x										
XS-N				x									
XS-55			x	x	x	x	x	x	x	x	x		
XS-CEM										x	x	x	x

Tab. 2: Incoatec products for XRF analyzer crystals.

In addition to these products we also develop special mirrors for specific applications. Send us your ideas!

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