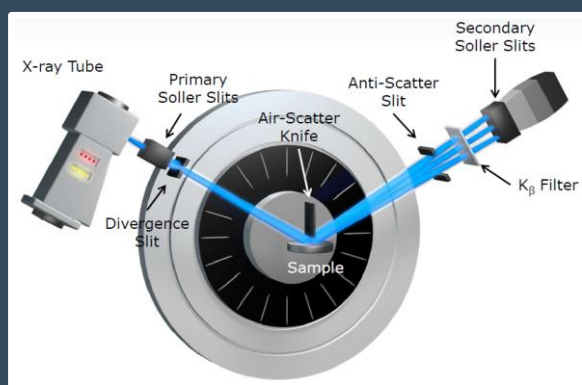


Where XRF can tell us what a sample contains, XRD can tell us what form it is in. A typical example of this is silicon dioxide (SiO_2), which form varies from amorphous glass, quartz, cristobalite and many other phases that are all chemically identical but have various structures and physical properties. XRD can be used to distinguish between these chemically identical phases, and XRF and XRD thus complement each other. XRD is used for both qualitative and quantitative phase analysis. The most common instrument set-up for XRD is the Bragg-Brentano geometry, see figure below.

TYPICAL APPLICATIONS

XRD is commonly performed on powder samples to achieve random orientation of the crystal planes, but for qualitative analysis there is also the possibility of analysing other sample types, e.g. bulk samples or filters. Elkem Technology's laboratory in Kristiansand houses a Bruker D8 Advance instrument set up in the Bragg-Brentano geometry.



(The Bragg-Brentano geometry)



(Bruker D8 Advance)

Elkem Technology have access to and experience in use of Brukers TOPAS (Total Pattern Analysis Solutions) software, which has capabilities ranging from single peak fitting to full-pattern Rietveld analysis.

The Topas software is extremely powerful, and if used correctly, could be used for structure refinement and even structure determination. In addition, it can be utilised to compare crystallite size and detect microstrain in a sample, or even quantify amorphous content in a sample containing both crystalline and amorphous components.



CONTACT

Pål Baggethun
R&D engineer
Elkem Technology
etlab@elkem.no
Mobile : +47 95496365

