**X-Ray Fluorescence (XRF)**

**S4 Pioneer**
(Bruker)

XRF is one of the best methods for elemental analysis. In XRF, the sample is bombarded with X-rays. This excites the sample to generate X-ray fluorescence. The X-rays “shoot” individual electrons out of the atoms of the elements, primarily out of the inner atomic shells K and L. The resulting vacancies are filled up again by electrons from higher energy shells. The excess energy of these electrons is then emitted in the form of X-ray fluorescence radiation. This radiation is characteristic for each element like a fingerprint and independent of the atom’s chemical bond. The intensity of the radiation is proportional to the concentration of the element in the sample. XRF, however, can directly analyze each element without destroying the sample and no sample preparation is required.

**Features:**

- **Analysis range:** Beryllium to Uranium
- **Concentration range:** Concentrations from sub ppm to 100%
**Sample form:** Powder, solid, liquid, paste, coating, slurry, film, filter deposit, etc.

**Sample size:**
- Liquids, loose powders: up to 50 mL
- Solids: up to 51 mm (2”), 47 mm (1.8”’) in height

**Gas for analysis of liquid and loose powders:** Helium or nitrogen, at reduced or normal atmospheric pressure

**Excitation:** End window Rh X-ray tube, 75 µm Be window

**Detector gas:** P10 gas (10 % methane, 90 % argon)

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**Charges**