

Sample preparation for XRF analysis of geological or mining materials and other inorganic samples

Contact us for more information

Sample preparation of geological materials, process samples and other related mining materials is a very important procedure in X-ray fluorescence analysis. This starts with an initial sample selection and subsequent preparation (i.e. crushing and milling) and ends up with a fine-grained powder (ideally < 50 µm). Borate fusion and pellet pressing are the two most common methods of sample preparation for X-ray fluorescence analysis of such materials.

Crushing

Crushing of the material is required to reduce its size and allow further processing such as representative subsampling, homogenization and grinding.

Fusion

For applications where accuracy and reproducibility play a significant role, you can dissolve the sample into a molten glass-forming flux at high temperatures. This ultimately results in a completely homogeneous glass disk. The particle size and matrix effects are then eliminated.

It is difficult to obtain suitable standards that have the same particle size, mineralogy, surface roughness and segregation characteristics as the production samples.

Therefore, the role of glass disks is extremely important in setting up reference calibrations for determining in-house standards for the production of control calibrations. This can be achieved by using Malvern Analytical fusion instruments.

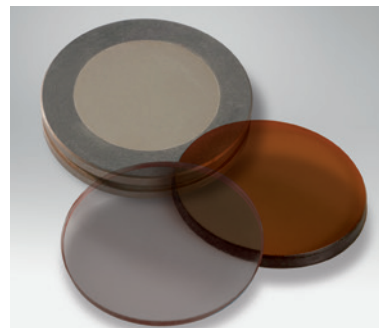
Grinding

It is necessary to grind the material into a fine powder to minimize undesired particle size effects and allow further processing like pressing or fusion.

Pressing

Pressed pellets are often used in production control, especially if the calibration ranges are narrow.

You can press pellets into Al cups or steel rings. The use of binders is usually required to achieve the necessary mechanical stability and robustness. Malvern Analytical also offers the ultra-wax binder to prepare high-quality pellets for the most demanding applications. This binder (and other consumable products) is available from the eStore for some countries.



Our expertise in fusion

Malvern Panalytical provides the most complete set of solutions regarding sample preparation by fusion to improve efficiency in the laboratory and to ensure the best analytical results. We develop automated fusion instruments powered by gas or electricity that can process from one to six beads simultaneously. We sell a wide range of chemicals, fluxes and consumables to customers all around the world.

Our expertise is reflected in services such as the selection and production of calibration standards, method development and on-site training. These services are contributing to an unsurpassed offer on the market.



TheOx Advanced



Eagon 2



LeNeo



M4

Analytical services

We can help you with the characterization of your sample as a RM Malvern Panalytical's facility in Nottingham is a center of excellence for X-ray fluorescence analysis together with standards development and production. The laboratory offers ISO 17025 accredited analytical services (under UKAS) for specific applications and can offer customized analysis of more diverse applications under the same infrastructure and protocols.

Malvern Panalytical's facility in Nottingham has the prestigious accreditation as a Reference Material Producer, accredited to ISO 17034 for both synthetic and natural materials by the United Kingdom Accreditation Service (UKAS).

MiniMill

MiniMill 2 is a compact benchtop planetary ball mill for highly reproducible, low-cost grinding. Its features include variable and programmable grinding speeds, timer, short grinding times and high fineness ratings.



Why is sample preparation important?

- To get the material in the correct form to fit into the spectrometer.
- To minimize effects such as particle size effect, mineralogical effect, surface roughness, etc.

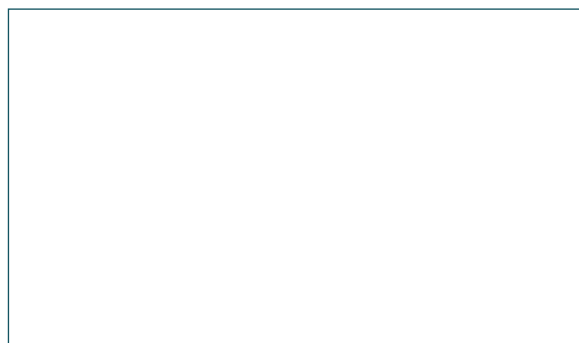
One of the many benefits of X-ray fluorescence (XRF) spectrometry and X-ray diffraction (XRD) is that they require only very simple preparation of samples for analysis. However, XRF and XRD deliver the most accurate and reliable measurements when close attention is paid to this vital part of the analytical process.

The automated laboratory

Within an automated laboratory, the complete sample transportation, preparation, and analysis process can be automated. Our automation projects can cover all steps involved in process control and quality control:

- Sample treatment before sending
- Sample transportation to and within the laboratory
- Preparation of the sample material
- Sample analysis and results distribution
- Control of the automated laboratory
- Container solutions

In addition to being the world's leading supplier for X-ray instruments, Malvern Panalytical recognizes the added value of X-ray systems in an integrated automated laboratory.



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