Katanax®
A SPEX SamplePrep Company

Benefits of Electric Fusion Fluxers Over Gas-Fired Machines

Definition

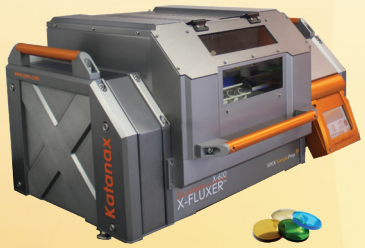
Fusion is a technique used to prepare inorganic samples, with a view to analyze them by x-ray fluorescence (XRF), inductively coupled plasma (ICP), atomic absorption (AA) or any traditional wet chemistry method. Typical samples include: cements, ores, slag, sediments, soils, rocks, ceramics, pigments, glasses and even metals.

A fusion can produce either a small, homogenous glass disk (or "bead") for XRF, or an acid solution for other analytical methods such as ICP.

Advantages

The process of fusion as a sample preparation method exhibits many advantages over other methods, as it does not produce mineralogical, grain size or orientation effects and the result is perfectly homogenous. Fusion is also capable of quickly preparing refractory samples that are otherwise hard to digest. Fusion fluxers are commercially available as fully electric or gas fired. Here we list the advantages of electric fluxers over gas fluxers.

KATANAX FUSION FLUXER



- Heavy-duty, fully automated electric fusion fluxers.
- Available as a one, two, three or six-position machine.
- High performance furnace with heating elements impervious to flux.
- Easy-clean, ceramic mold holders. Mold holder system is user configurable for 30, 32, 35 or 40 mm molds.

To see a video of this product visit our YouTube Channel:
www.youtube.com/sampleprep

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Electric Fluxer Benefits

1. Katanax X-Fluxers are fully electrical, they are impervious to gas pressure drops, inter-burner temperature variations and altitude effects. They are simple to install and are not subject to gas regulations (AGA, CGA ...).
2. Since the molds are at the same temperature as the crucible and its contents, crystallized or cracked disks are very rare.
3. Consistent furnace temperature between fusion cycles and across positions in the furnace.
4. Better temperature control from room temperature, up to 1200°C allowing for retention of volatile elements. (Gas fluxers produce a temperature gradient across the crucible contents.)
5. All fusion parameters can be modified: heating and cooling duration, mixing speed and amplitude, furnace temperature, temperature ramping, holding temperature (furnace temperature between fusions).
6. Higher performance at high altitudes than gas-fired machines (do not require oxygen for gas combustion).
7. Air/oxygen injector into crucibles is not needed, as the reaction environment is not a flame, therefore no compressed air or oxygen is required.
8. Low Power consumption (240 VAC, 15 A max for triple position, 20A for six position). The cost of running a gas unit goes beyond just the raw price of the gas. You have to consider delivery of gas bottles, standing charges, cost of erection and maintenance of explosive gas cage and extra ventilation costs. A gas unit doesn't just use gas for power, it also needs electricity to run the computer software that instructs the machine what to do.
9. Operate free of supervision.

Gas-Fired Instruments Disadvantages

1. Safety: hot flames, risks of intoxication or explosion.
2. Poor temperature control.
   - Gas fluxers have inferior temperature control due to burner orifices clogging over time, line pressure variations, gas quality (in some countries), altitude and lack of direct temperature monitoring. Consequently, results may be inconsistent due to evaporation of flux and other compounds.
3. Not the optimal environment for sample oxidation.
   - A flame is a reducing atmosphere
   - Temperature is not uniform in the crucible (heated only from bottom in a flame) and low temperature is mostly impossible.
4. Affected by altitude (thus the need to sometimes use an oxygen injector).
5. Strong vent hood and custom gas piping required.

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