



Fusion Monitor

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2. Fusion Monitor



What is the Fusion Monitor?

It is designed for a quick, easy and proactive quality assessment and **monitoring of the fusion process and platinumware.**

- The pre-fused mixture of lithium borate flux and sample is:
 - Chemically and physically stable
 - Independent of the sample preparation step

The Three Steps of Sample Preparation and XRF Analysis²⁹

Fluxers, individual fluxer position, platinum molds, fusion temperatures...

Fusion Process

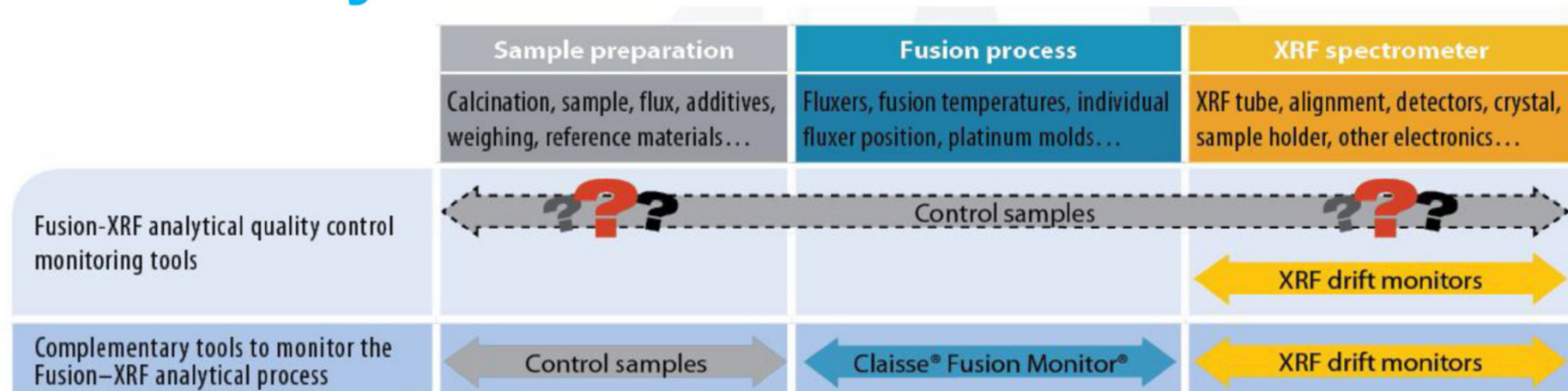
Calcination, sample, flux, additives, weighing, reference materials...

XRF Spectrometer

XRF tube, alignment, detectors, crystal, sample holder, other electronics...

Sample Preparation

The Three Steps of Sample Preparation and XRF Analysis³⁰



It is the only product that allows the isolation of the fusion process.

- Stability of the fusion process
- Wear and tear of the platinum molds
- Temperature bias between different positions within one fusion instrument
- Temperature bias between different fusion instruments

Why Use the Fusion Monitor?

- The Fusion Monitor quality control mixture was designed to fulfill a “**missing link**” in the quality control process for applications in fusion for XRF analysis.
- It is useful for laboratories that use fusion and that are interested in following changes in the fusion instrument, the platinumware and the temperature as well as in monitoring any drift associated with it.

Characteristics of the Fusion Monitor

- Quality control tool
- Not a CRM or a RM
- Easy to use
- Universal quality control since it is made on a comparison basis



Who Can Use the Fusion Monitor?

Any laboratory that does fusion for XRF analysis.

The Fusion Monitor chemical compound is used as a comparison tool for either the percentage/concentration of elements or counts.

On day 1, simply weigh it in your Pt/Au crucible ($\pm 0.1\text{g}$) and fuse it using your regular fusion and analytical methods (3 to 5 replicates). Then use this first set of results obtained as a reference to compare the following results.

Example of a Comparison with the Fusion Monitor

Element	SiO ₂ (%)	Al ₂ O ₃ (%)	Fe ₂ O ₃ (%)	CaO (%)	MgO (%)	SO ₃ (%)	Na ₂ O (%)	K ₂ O (%)	TiO ₂ (%)	P ₂ O ₅ (%)	Mn ₂ O ₃ (%)	SrO (%)	Cr ₂ O ₃ (%)	ZnO (%)
Référence value obtained	20,412	5,352	2,366	65,708	2,616	3,718	0,240	0,919	0,265	0,207	0,059	0,224	0,009	0,051
Day 1	20,435	5,344	2,363	65,664	2,614	3,718	0,241	0,922	0,267	0,202	0,056	0,225	0,011	0,051
Day 2	20,394	5,332	2,360	65,699	2,618	3,708	0,243	0,923	0,273	0,200	0,057	0,225	0,010	0,051
Day 3	20,418	5,325	2,365	65,706	2,613	3,721	0,242	0,925	0,273	0,209	0,057	0,225	0,007	0,052
Day 4	20,419	5,334	2,380	65,666	2,621	3,715	0,247	0,920	0,270	0,200	0,057	0,225	0,010	0,051
Day 5	20,397	5,323	2,367	65,708	2,615	3,727	0,242	0,919	0,275	0,201	0,058	0,226	0,009	0,052
Day 6	20,408	5,343	2,376	65,632	2,620	3,686	0,241	0,915	0,271	0,204	0,058	0,225	0,008	0,051
Day x	19,980	5,159	2,359	64,922	2,598	3,050	0,150	0,907	0,200	0,190	0,045	0,201	0,006	0,045
	2%	4%	0%	1%	1%	18%	38%	1%	24%	8%	24%	10%	33%	12%

Points to Keep in Mind When Using the Fusion Monitor

- What bias should be considered as out of line?
- When should we investigate our fusion process?
- It depends on your own criteria...

Benefits of Using the Fusion Monitor

- Completely independent of the sample preparation step
- Can be fused directly from the bottle
- No manipulation errors
- Easy to use
- No need for highly qualified personnel
- Universal
- Can be used regardless of the flux brand and composition

Benefits of Using the Fusion Monitor

- It's a quality control tool that helps diagnose the root cause of an analytical problem.
- It saves time in trouble shooting.
- It allows to compare different instruments or different positions on the same instrument.

