

Series of ten heating and cooling cycles

INTRODUCTION

THEMYS FLASH has the capability of applying fast thermal cycles to a tested sample. This can for instance be necessary to characterize the evolution of the material upon thermal ageing when exposed to demanding conditions in its lifespan. It is the case of metallic or ceramic materials used in turbines, or in power generation processes.

EXPERIMENT

THEMYS FLASH is equipped with a high-efficiency image furnace. Up to 5 samples can be weighed by a balance in order to study their mass variations during the temperature cycles.

Samples : one alumina sample (inert)

Program: ten successive cycles between 215 and 1150°C

- 5 minutes heating up to 1150°C
- 55 minutes isotherm
- Cool down to 215°C

Atmosphere: air at 10ml/min.

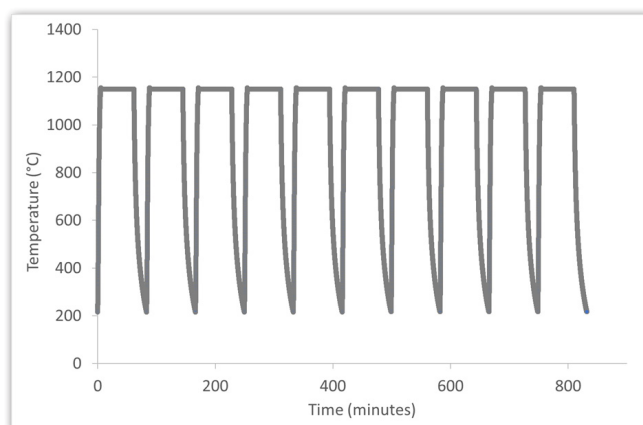


Figure 1 - Temperature cycles

RESULTS AND CONCLUSION

The ten temperature cycles are very repeatable as seen on Figure 1. The isothermal sequences at 1150°C are stable within +/-0.1°C.

The noise of the mass variation signal during the isothermal sequences does not exceed 1 microgram. Note that on Figure 2, the variation in the mass signal during each step are due to a common physical phenomenon called buoyancy effect. When necessary, post-processing after a blank experiment allows to clear out this drift effect.

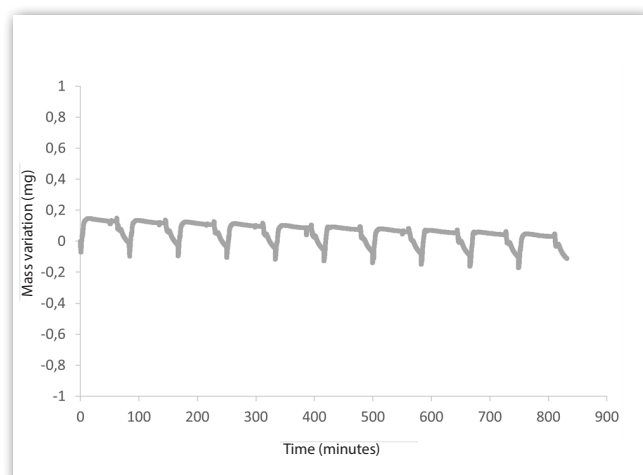


Figure 2 - Mass variation signal

INSTRUMENT

THEMYS FLASH

Ambient to 1200°C



- **MULTIPLE SIMULTANEOUS MEASUREMENTS**
with a flexible balance integrating up to 5 weighing modules
- **HIGH ACCURACY & VERSATILE**
hang-down symmetrical beam balance specifically designed for TGA applications
- **FAST HEATING AND COOLING**
thanks to its unique design of image furnace
- **FAST TEMPERATURE CYCLING CAPABILITY**
to simulate some real materials' ageing conditions
- **A VARIETY OF ATMOSPHERE CONDITIONS**
with the possibility of operating under oxidative gas, inert gas, or vacuum