23rd European Conference on Thermophysical Properties
June 21 to 24, 2026
Serge Kampf les Fontaines Castle, FRANCE
www.ectp2026.com

Modernization of an Oscillating Cup Viscometer

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Measuring the viscosity of high-temperature molten salts is highly demanding, especially if this is done at temperatures above 550 °C because of materials compatibility, metal corrosion and chemical reactivity. Our instrument, designed and constructed by the end of last century, was modified to achieve a better uncertainty in the measurements. These modifications included:

- Redesign of suspension/fixing mechanism of the wire, to avoid wire smashing and slipping
- Changing the manual initiation of the oscillation to microprocessor driven automatic initiation
- Improve the optical detection of the oscillation curve, for more accurate determination of the oscillation period and logarithm decrement (laser detectors window, light beam path)
- Improve the inertia disks used to calculate the moment of inertia of the suspension system (same metal, different masses, different radius)
- Data acquisition system redesign, including a new computer, new software (in Linux), and computer/timer and thermocouple interfaces
- Redesign the temperature measuring system, including the temperature controller of the oven, the thermocouple location
- Restructuring the calculation software used to obtain the viscosity.

A brief tour to these modifications and their contribution to decrease the viscosity uncertainty will be reported.

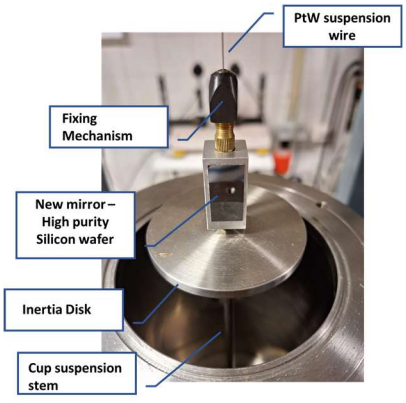


Figure 1. View of some physical modifications done.

Acknowledgment

This work was partially funded by Fundação para a Ciência e Tecnologia, Portugal, through Projects UID/QUI/00100/2019, UIDB/00100/2020, UID/00100/2025 and UID/PRR/100/2025 of Centro de Química Estrutural, and Project NEWS4CSP, 2022.05021.PTDC.

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