Temperature controlled interfacial rheology using a BiCone

Authors: Cornelia Küchenmeister-Lehrheuer and Fabian Meyer

Keywords
HAAKE MARS Rheometer models

The measuring configuration based on a BiCone geometry enables the user to perform temperature controlled interfacial experiments using a Thermo Scientific™ HAAKE™ MARS™ 40 & 60 Rheometer or predecessors models. This setup can be used for testing the rheological properties of an interfacial film formed between either two liquid phases or a liquid and a gas phase.

The BiCone setup consists of a biconical rotor and measuring cup as well as an optional insulation sleeve (Figure 1). The BiCone rotor has a diameter of 68 mm and a cone angle of 10° and is made of titanium. The measuring cell includes a glass insert with a recess mark in the middle for correct filling. The interface layer of the test sample can be observed through the openings of the outer measuring cup. The cup is closed with a two piece lid with a hole in the centre for the measuring shaft of the BiCone rotor. For temperature control the measuring cup can be positioned on any temperature module for cone or plate geometries (TM-PE-P, TM-EL-P, TM-LI-P and TM-PE-C*).

The investigation of rheological behavior at the interface between two immiscible liquids or a liquid and a gas has been used to predict the stability of emulsions, foams and other complex systems. Using a Du Noüy ring setup as described in [2, 3] is an alternative technique for interfacial experiments. In comparison to the Du Noüy geometry the BiCone has an extended measuring range. Measurements on phases with higher viscosities or stiffer interfacial layers can be performed.

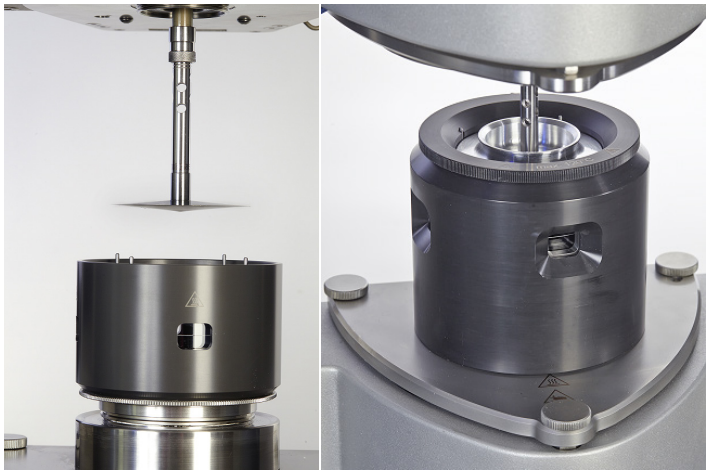

Figure 1: BiCone interfacial rheology setup in standby position (left) and in measuring position (right).

Figure 2: Content of delivery of cup for BiCone (from left to right): cup for BiCone with glass ring insert and securing ring, two pieces lid, tool for mounting the securing ring; Insulation sleeve (not included and has to be ordered separately).

* The following parts are necessary for use in combination with the TM-PE-C: 222-2010 measuring plate insert, 006-2181 clamping ring, spare part: 085-1450 screws (3 pcs.).

ThermoFisher SCIENTIFIC

thermo scientific

Ordering information

Part	Order no.
BiCone rotor BC 68/5° made out of titanium with “Connect Assist” for HAAKE MARS 40 & 60 Rheometers	222-2239
BiCone rotor BC 68/5° made out of titanium for predecessors models (MARS I & III Rheometers)	222-2067
Cup for BiCone	222-2066
Insulating sleeve for cup for BiCone	222-2068
HAAKE RheoWin software tool “Interfacial rheology”	098-5057

References

1. Meyer Fabian, Nijman Jint “BiCone interfacial rheology“. Thermo Fisher Scientific User guide (006-2336).
2. Meyer Fabian, Nijman Jint “Du Noüy ring measuring geometry”. Thermo Fisher Scientific User guide (006-2335).
3. Küchenmeister-Lehrheuer Cornelia, Nijman Jint, Plog Jan Philip “Du Noüy ring for interfacial rheology“ Thermo Fisher Scientific Product information P026.

Find out more at **thermofisher.com/rheometers**

ThermoFisher SCIENTIFIC