

Drop Volume Tensiometer DVT50



Analysis of emulsions under dynamic conditions

Surfactants as emulsifiers reduce the interfacial tension between liquids which otherwise do not easily mix. As this takes a certain time, the effect of an emulsifier depends on the mixing dynamics. With the Drop Volume Tensiometer – DVT50, you can measure the speed with which emulsifiers act at the interface. The wide speed range of the analysis enables the dynamic mixing behavior as well as the stability of an emulsion to be determined. The analyses help you to precisely optimize and dose emulsifiers and to evaluate phase interactions at different speeds.

Tasks and applications

- Development of emulsifiers in the pharmaceutical and cosmetics industry
- Emulsion stability in food production
- Emulsion formation and demulsification in enhanced oil recovery
- Mobilization of oily dirt during cleaning
- Testing the aging status of insulating oils as specified in IEC 62961:2018

Measuring methods and options

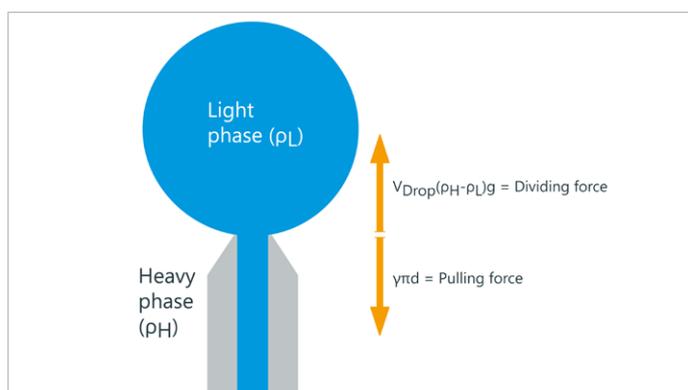
- Dynamic interfacial tension using rising drops of the lighter liquid
- Dynamic interfacial tension using descending drops of the heavier liquid
- Dynamic surface tension using falling drops
- Temperature control from -10 to 90 °C, temperature measurement with internal sensor

How the drop volume method of the DVT50 works

In the drop volume method, a liquid is introduced into a bulk phase through a capillary. As a result of the interfacial tension, the drop tries to keep the interface with the bulk phase as small as possible. As a new interface comes into being when the drop detaches from the capillary outlet, it is necessary to overcome the corresponding interfacial tension. The drop does not detach until the lifting force or weight compensates the interfacial tension. This means that, knowing the density difference between the phases, the interfacial tension can be calculated from the volume. Drop detachment is detected using a light barrier and the volume is known due to the precisely set flow rate.



Fully automatic liquid dosing for investigating two-phase systems



Measuring principle of a drop volume tensiometer

Variable measuring arrangement for different types of emulsion

With the DVT50, we have provided a flexible arrangement of measuring cell and dosing capillary to facilitate the simulation of the proportions in oil-in-water emulsions and water-in-oil emulsions. The results therefore enable the particular emulsion type to be optimized. To achieve fast sample changeover and correspondingly high sample throughput, we have made sure that the instrument is easy to handle when filling and cleaning.

Transparency in measurement and data management

With integral and adaptable measuring templates, the software reduces your preparation time to a minimum. Results management is easy thanks to automatic overview diagrams, comprehensive measuring reports, and clear data organization.

Specifications

Volume measurement

Maximum volume	220 μL
Resolution	0.001 μL
Measurement rate	4 Hz

Syringe drive

Syringe volume	50 to 2500 μL
Flow rate	0.265 to 1985 $\mu\text{L}/\text{min}$
Resolution	0.001 μL

Automation

Fully automatic refill	yes
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Interfacial and surface tension

Range	0.1 to 100 mN/m
Resolution	0.001 mN/m

Temperature control

Range	-10 to 90 $^{\circ}\text{C}$
Flow-through thermostat	optional

Temperature measurement

Range	-20 to 150 $^{\circ}\text{C}$
Resolution	0.1 $^{\circ}\text{C}$