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Mode d'emploi

Micro ostwald viscometer

Gebrauchsanleitung Seite 1 3

Wichtige Hinweise: Die Gebrauchsanleitung vor der ersten Inbetriebnahme des Mikro - Ostwald Viskosimeters bitte sorgfältig lesen und beachten. Aus Sicherheitsgründen darf das Mikro - Ostwald Viskosimeter ausschließlich nur für die in dieser Gebrauchsanleitung beschriebenen Zwecke eingesetzt werden.

Bitte beachten Sie auch die Gebrauchsanleitungen für die anzuschließenden Geräte.

Alle in dieser Gebrauchsanleitung enthaltenen Angaben sind zum Zeitpunkt der Drucklegung gültige Daten. Es können jedoch von SCHOTT sowohl aus technischen und kaufmännischen Gründen, als auch aus der Notwendigkeit heraus, gesetzliche Bestimmungen der verschiedenen Länder zu berücksichtigen, Ergänzungen am Mikro - Ostwald Viskosimeter vorgenommen werden, ohne daß die beschriebenen Eigenschaften beeinflußt werden.

Operating Instructions Page 4 6

Important notes: Before initial operation of the Micro Ostwald Viscometer please read and observe carefully the operating instructions. For safety reasons the Micro Ostwald Viscometer may only be used for the purposes described in these present operating instructions.

Please also observe the operating instructions for the units to be connected.

All specifications in this instruction manual are guidance values which are valid at the time of printing. However, for technical or commercial reasons or in the necessity to comply with the statutory stipulations of various countries, SCHOTT may perform additions to the Micro Ostwald Viscometer without changing the described properties.

Mode d'emploi Page 7 9

Instructions importantes: Prière de lire et d'observer attentivement le mode d'emploi avant la première mise en marche du Micro viscosimètre selon Ostwald. Pour des raisons de sécurité, le Micro viscosimètre selon Ostwald pourra être utilisé exclusivement pour les usages décrits dans ce présent mode d'emploi.

Nous vous prions de respecter également les modes d'emploi pour les appareils à connecter.

Toutes les indications comprises dans ce mode d'emploi sont données à titre indicatif au moment de l'impression. Pour des raisons techniques et/ou commerciales ainsi qu'en raison des dispositions légales existantes dans les différents pays, SCHOTT se réserve le droit d'effectuer des suppléments concernant le Micro viscosimètre selon Ostwald qui n'influencent pas les caractéristiques décrites.

Manual de instrucciones Página 10 12

Instrucciones importantes: Primeramente, lean y observen atentamente el manual de instrucciones antes de la primera puesta en marcha del Micro viscosímetro de Ostwald. Por razones de seguridad, el Micro viscosímetro de Ostwald sólo debe ser empleado para los objetivos descritos en este manual de instrucciones.

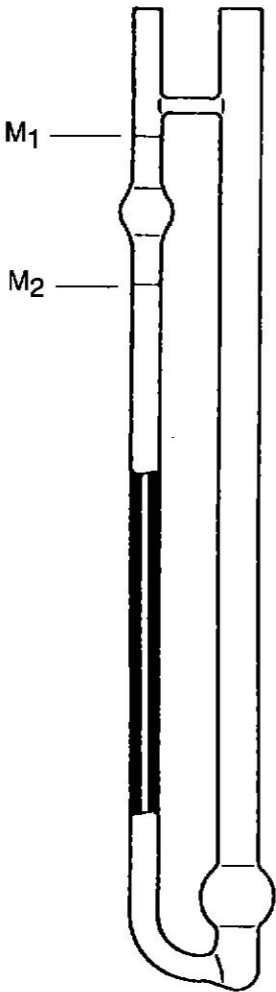
Por favor, respeten las indicaciones descritas en los manuales de instrucciones de los equipos antes de conectarlos.

Todos los datos contenidos en este manual de instrucciones son datos orientativos que están en vigor en el momento de la impresión. Por motivos técnicos y/o comerciales, así como por la necesidad de respetar normas legales existentes en los diferentes países, SCHOTT puede efectuar modificaciones concernientes al Micro viscosímetro de Ostwald sin cambiar las características descritas.

Operating Instructions

Ostwald Micro Viscometer

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1 Preparation of sample

Low-viscosity samples must be filtered through a SCHOTT glass filter porosity 2 to 4 (10 ... 100 μm) before the measurement; high-viscosity samples, through a sieve with 0.3 mm mesh width (test sieve cloth 0.2, DIN 4188). Samples, whose stock value in accordance with DIN 51 583 or pour point in accordance with DIN 51 597 is not at least 30 °C lower than the test temperature, must be heated up to 50 °C before the measurement.

2 Selection of capillary

The size of the capillary is to be selected in such a way that the uncertainty inherent in the Hagenbach Correction does not exceed the allowable error for the time measurement (see table). For precision measurements should, therefore, be chosen no flow times below 30 seconds. If necessary, a viscometer with a smaller capillary is to be used.

3 Cleaning of viscometer

Before the first use, a cleaning with 15 % H_2O_2 and 15 % HCl is recommended. The viscometer should then be rinsed with a suitable solvent. It must be completely dry and dust-free.

4 Measuring operation

Exactly 2 ml of the sample liquid are filled with a pipette into the wider one of the viscometer tubes.

Hang viscometer with its stand Type No. 053 97 into a Glass-Panelled Thermostatic Bath from SCHOTT-GERÄTE GmbH.

To obtain the measuring accuracy of the viscometer, the constant temperature bath should maintain the set temperature at a constant ± 0.01 °C (**Glass-Panelled Thermostatic Baths from SCHOTT-GERÄTE GmbH**). Differences in temperature of only 0.1 °C may cause an error of as much as 0.6 % in mineral oils. Measuring should take place only after an equilibration time of approx. 5 minutes.

The liquid is siphoned above the upper measuring mark M1. Then the flow time between the two timing marks M1 and M2 is measured. The measuring operation can be repeated as often as necessary.

When using the viscometers in automated viscosity-measuring units (AVS) by SCHOTT-GERÄTE, the viscosity is measured automatically.

Subjective measuring errors are eliminated, and the efflux times measured are available as a printed-out document. According to the type and number of samples to be measured, an optimum measuring device may be assembled which can be expanded to an automatic sampler. Rinsing and filling of viscometers and measuring of sample with subsequent changing of sample is performed automatically. The timing marks required for manual measuring are replaced by light barriers.

The accuracy obtained with the AVS automated measuring system is greater since certain parameters such as errors in reading, clock errors, etc. are eliminated.

5 Calculation of viscosity

The seconds contribution given in the table for the Hagenbach Corrections is to be subtracted from the measured flow time for the various capillaries. Intermediate values can be interpolated.

With absolute measurements, the corrected flow time multiplied by the viscometer constant K, produces the kinematic viscosity [mm²/s]* directly.

$$\nu = K (t - \phi)$$

The viscometer constant K is mentioned in the enclosed production certificate.

6 Example of calculation

Ostwald Micro Viscometer

Type No. 516 10

Capillary l

Constant = 0.0100

Flow time (averaged) = 40.00 s

Hagenbach Correction for 40,00 s ϕ = 0.18 s

Kinematic viscosity $\nu = K (t - \phi)$

$$= 0.0100 (40,00 - 0,18)$$

$$= 0.3982 \text{ [mm}^2\text{/s]}^*$$

* previously centistokes [cSt];

$$1 \text{ cSt} = 1 \text{ mm}^2\text{/s}$$

7 Table of Hagenbach Corrections (HC) for:

Ostwald Micro Viscometers

Type No. 516 .., 517 .., 518 ..

Correction seconds¹⁾:

Flow time [s]	Capillary no. l	Capillary no. lc
30	0.32	0.05
35	0.23	0.03
40	0.18	0.03
45	0.14	0.02
50	0.11	—
55	0.09	—
60	0.08	—
65	0.06	—
70	0.06	—
75	0.05	—
80	0.04	—

¹⁾The correction seconds stated are related to the respective theoretical constant.