Research group Membrane Materials and Processes

Technische Universiteit Eindhoven University of Technology

Stabinger Viscometer

Anton Paar, SVM™ 3000

www.tue.nl/mmp

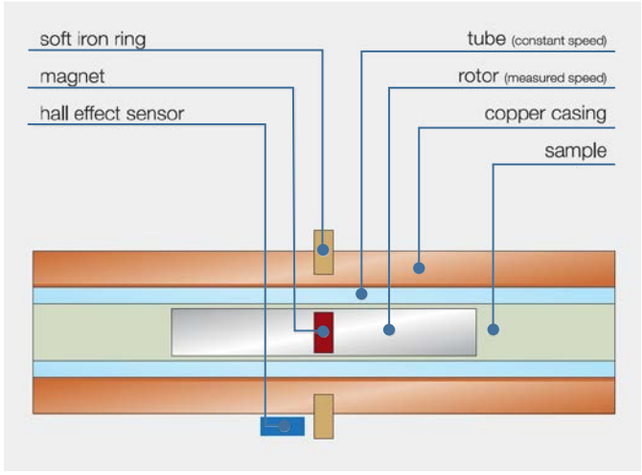
Introduction

The Anton Paar Stabinger Viscometer SVM™ 3000 is a rotational viscometer with a cylinder geometry that is based on a modified Couette principle with a rapidly rotating outer tube and an inner measuring bob that rotates more slowly.

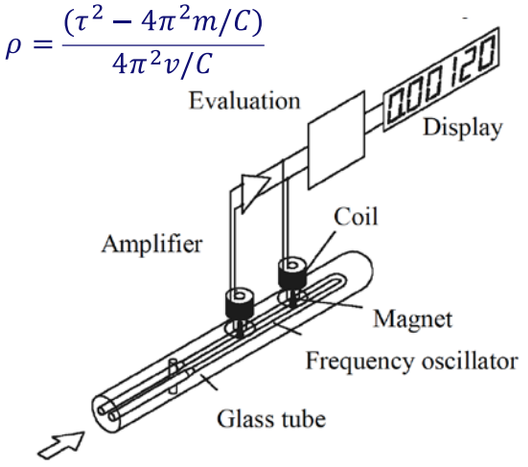
Principle

The viscosity measurement is based on a torque and speed measurement. A rotating magnet produces an eddy current field with an exact speed dependent brake torque. Shortly after the start of the measurement the rotor reaches a stable speed. This is determined by the equilibrium between the effect of the eddy current brake and the shear forces at work in the sample. The dynamic viscosity [mPa·s] is calculated from the rotor speed. The integrated density [g/cm^3] measurement is carried out by the oscillating U-tube principle. This allows to calculate the corresponding kinematic viscosity [mm^2/s].

From only 2.5 mL of sample the SCM™ 3000 determines dynamic viscosity, kinematic viscosity and density.



$$\rho = \frac{(\tau^2 - 4\pi^2 m/C)}{4\pi^2 v/C}$$



Principle of rotational viscosity meter and oscillating U-tube density measurement. (C = spring constant)

Applications

Determination of dynamic viscosity and density of feed and permeate streams.

Sample characteristics			
Sample volume (mL)	2.5	Max filling viscosity (mPa·s)	2000
Reproducibility			
Viscosity (%)	0.35	Temperature (°C)	0.02
Density (g/cm^3)	0.0005		
Measuring range			
Dynamic viscosity (mPa·s)	0.2 to 20,000	Temperature (°C)	-56 to 105
Density (g/cm^3)	0.65 to 3		