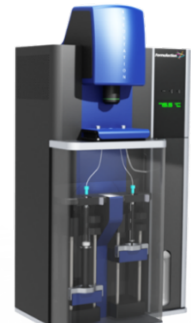


Viscosity of liquids with Fluidicam® Rheo

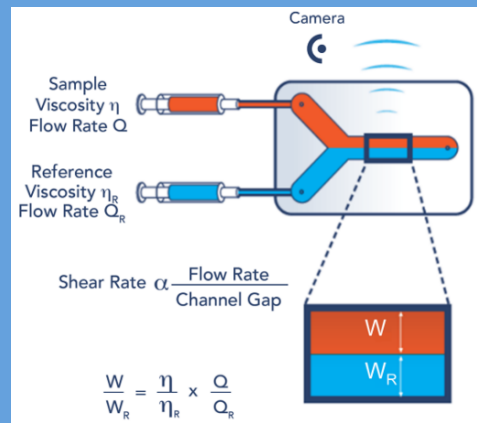


Introduction

Analyzing highly liquid products such as vaccines or water-based formulations is a delicate matter as traditional techniques are insensitive to low viscosities. Fluidicam technology allows for fast and precise measurements even for low viscosity products with minimal sample volume.

Reminder on the technique

FLUIDICAM RHEO uses a co-flow microfluidic principle to measure viscosity of various products. A sample and viscosity standard are introduced together in the microfluidic channel (typically 2.2mm X 150µm) where they undergo strong confinement. Applied shear rate is simply adjusted by a computer-controlled syringe pump. Under these conditions, the interface position is related to the viscosity ratio between the sample and the reference. Images of the resulting laminar flow are acquired thanks to an integrated camera and the viscosity of the sample is automatically extracted as a function of shear rate and plotted directly in the software giving a resulting rheological curve.



Experimental results

Water, ethanol and methanol were analyzed at 25°C using a mechanical rheometer and with FLUIDICAM (Fig 1). At shear rates below 10 s⁻¹ rheometer measurements oscillate to negative values. Above 100s⁻¹ the Taylor-Couette instability can be noticed. On the other hand, samples run with FLUIDICAM present expected Newtonian behavior and can be easily distinguished from one another.

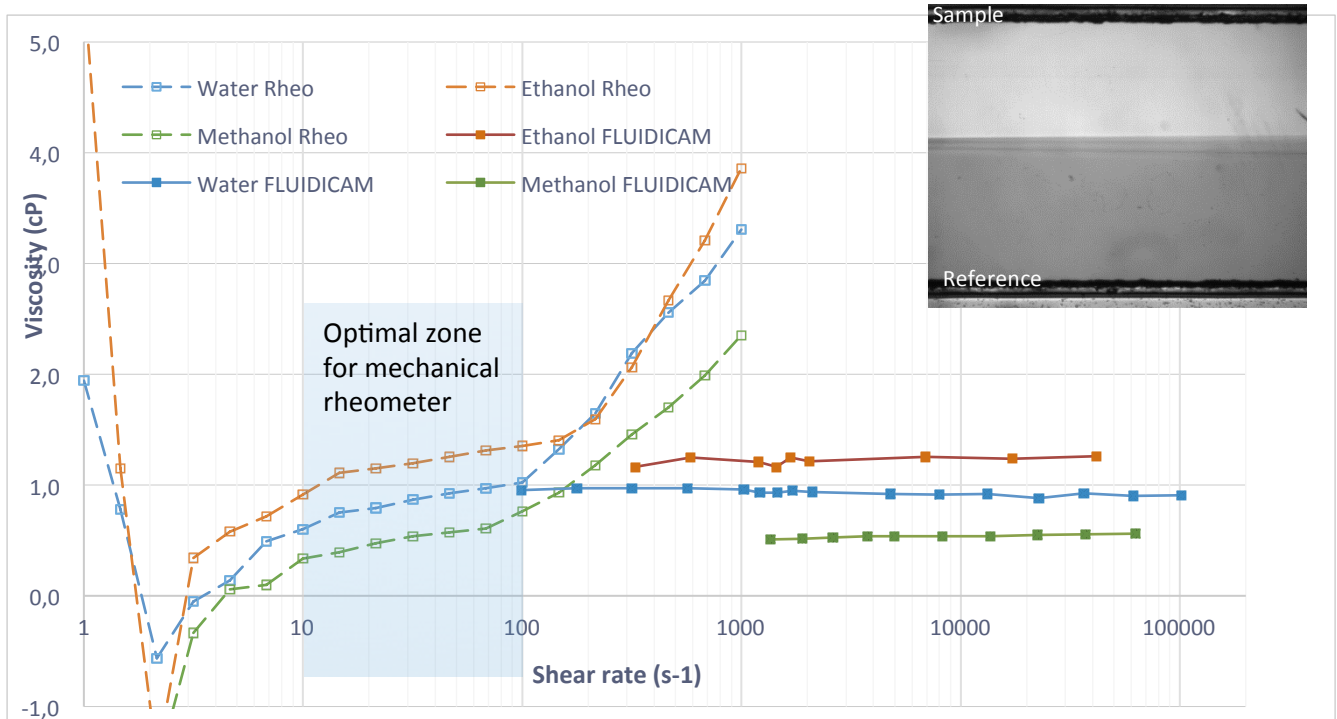


Fig 1. Viscosity as a function of shear rate at 25°C