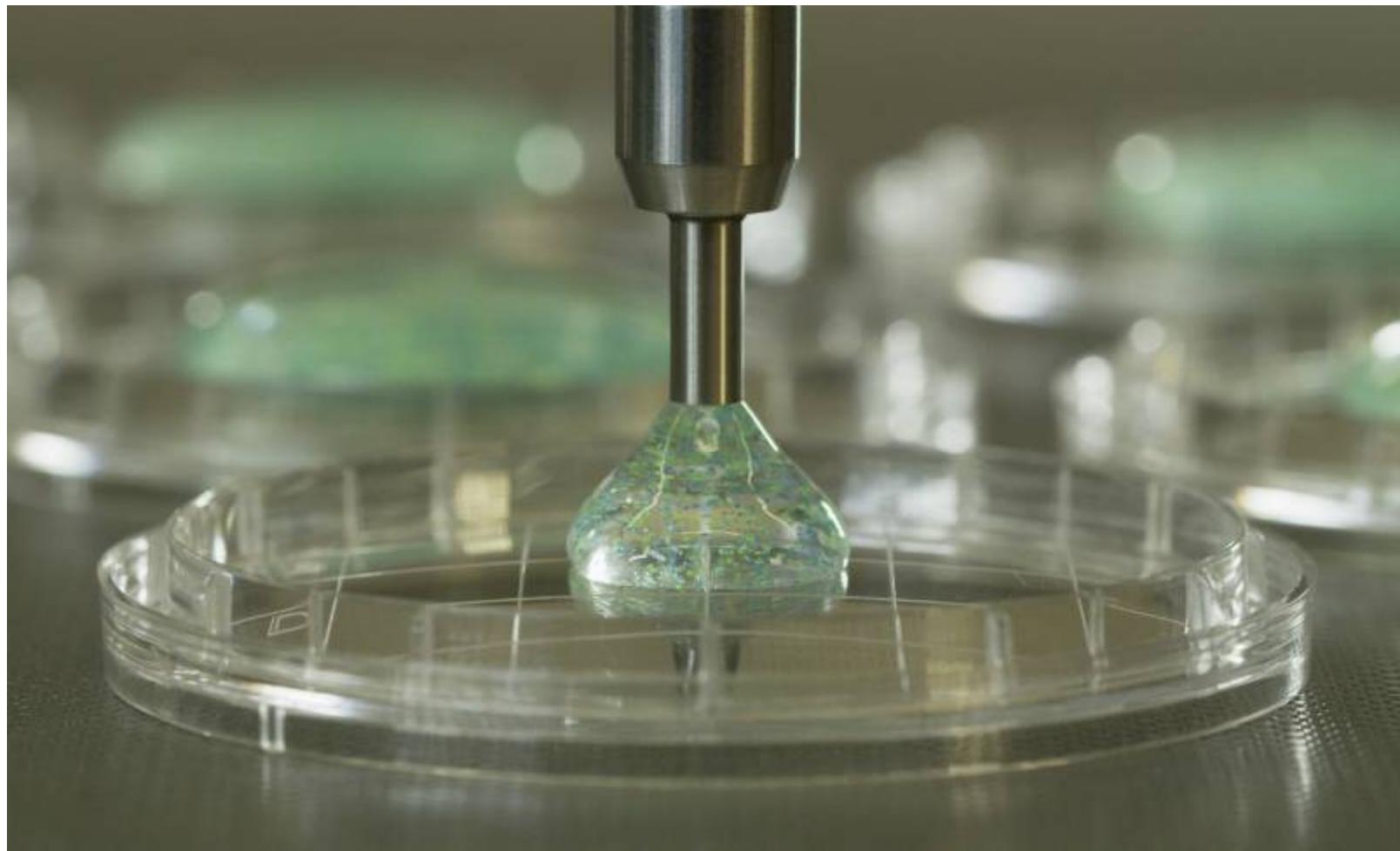


Esperienze di Reologia mediante un semplice viscosimetro a capillare homemade

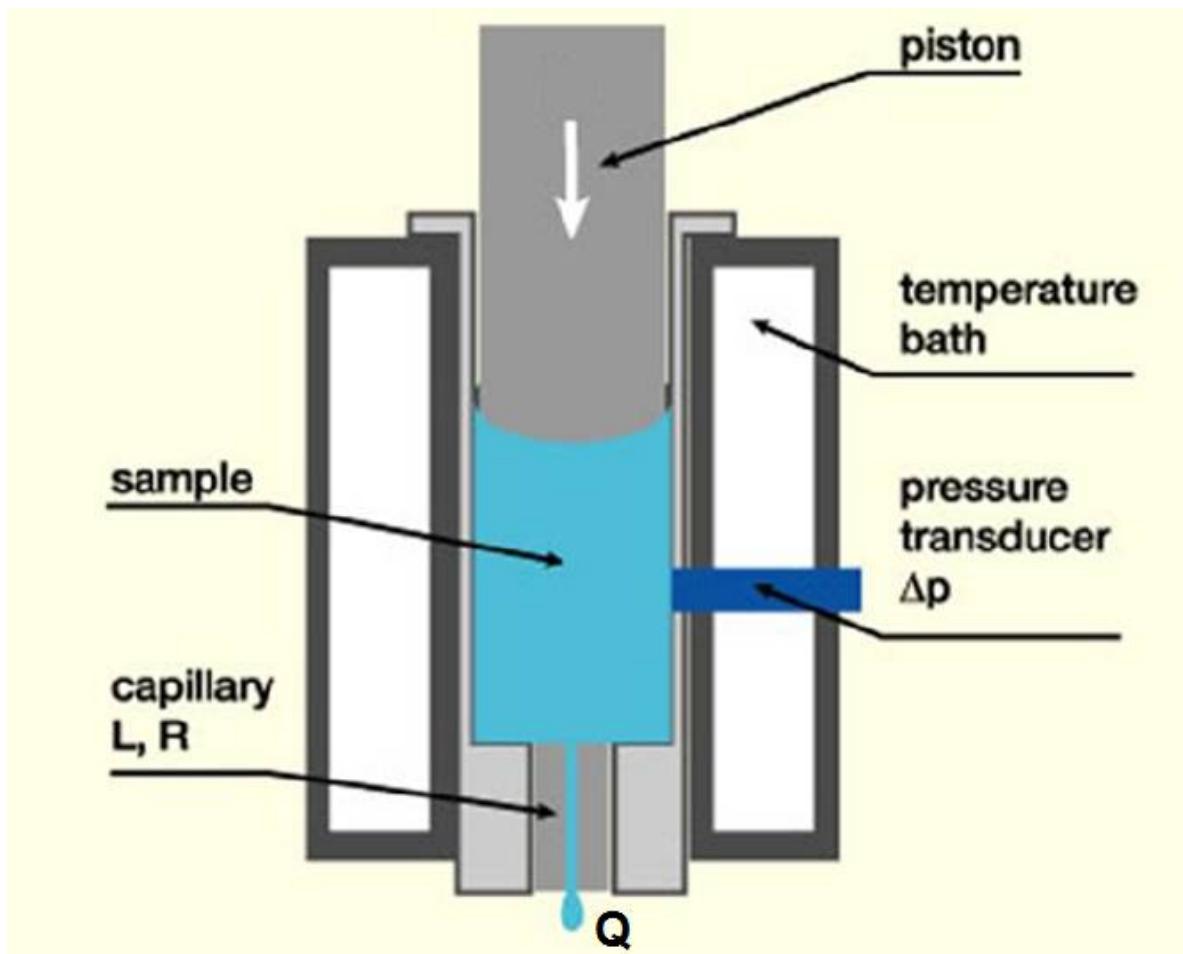
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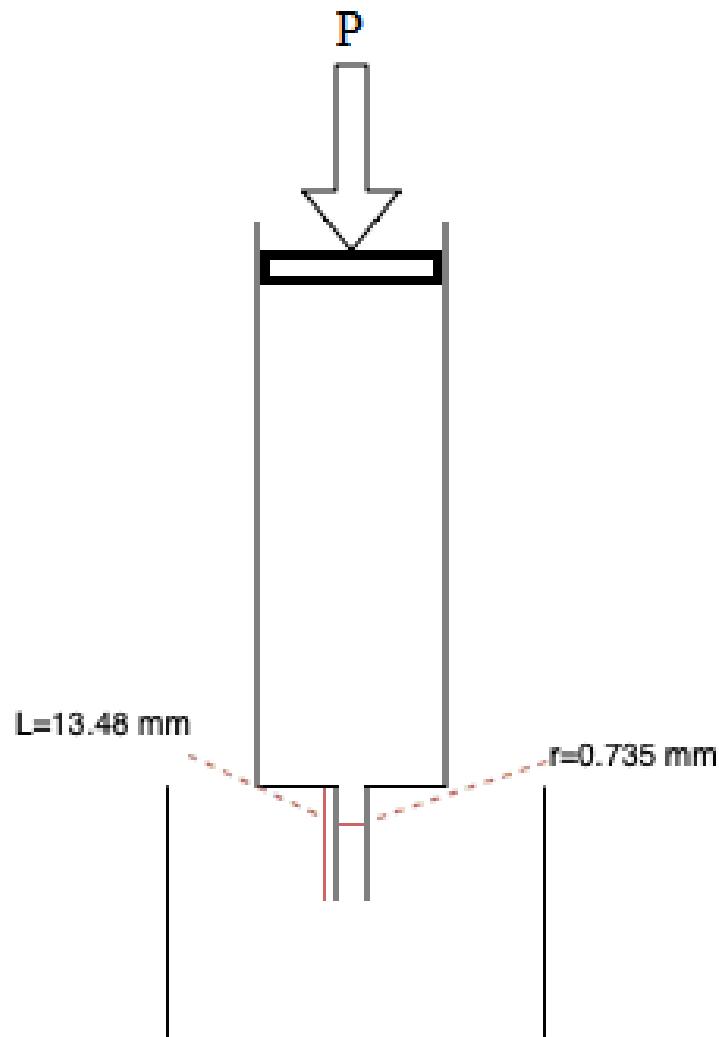
Viscosimetro a capillare



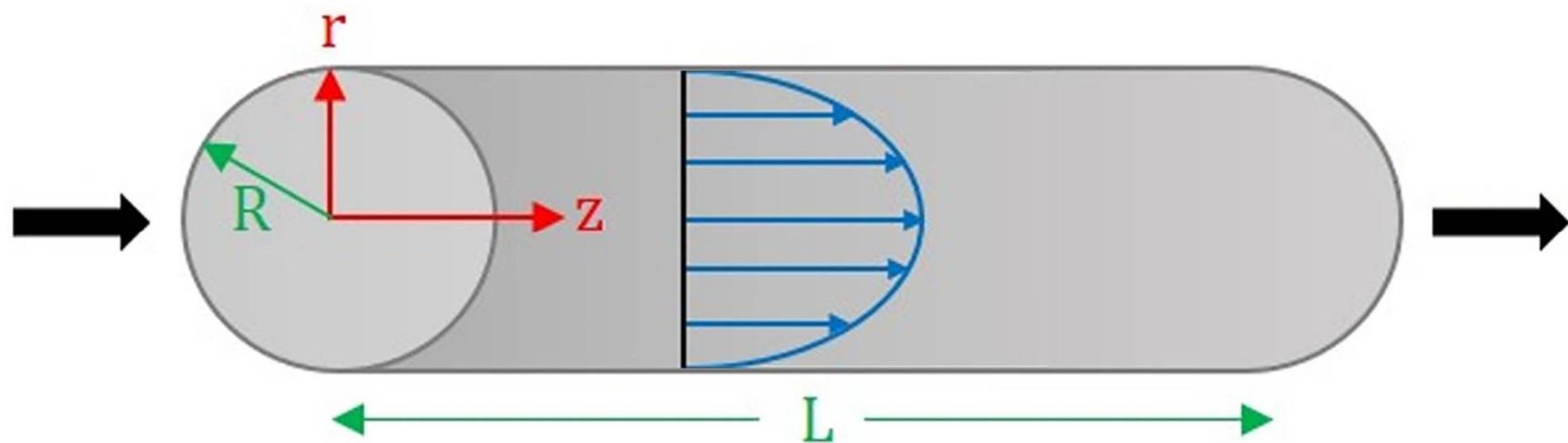
Capillary viscometers

- **High-pressure capillary viscometers with electric drive**
high shear stress values (up to 900 kPa)
- **Capillary viscometers utilizing gas pressure**
a typical value would be 25 kPa

Picture of the capillary viscometer used for measurements (up to 100 kPa)



Parabolic profile of the flow velocity of a Newtonian fluid in a cylindrical capillary



Poiseuille equation

$$\eta = \frac{\pi R^4 \Delta p}{8LQ}$$

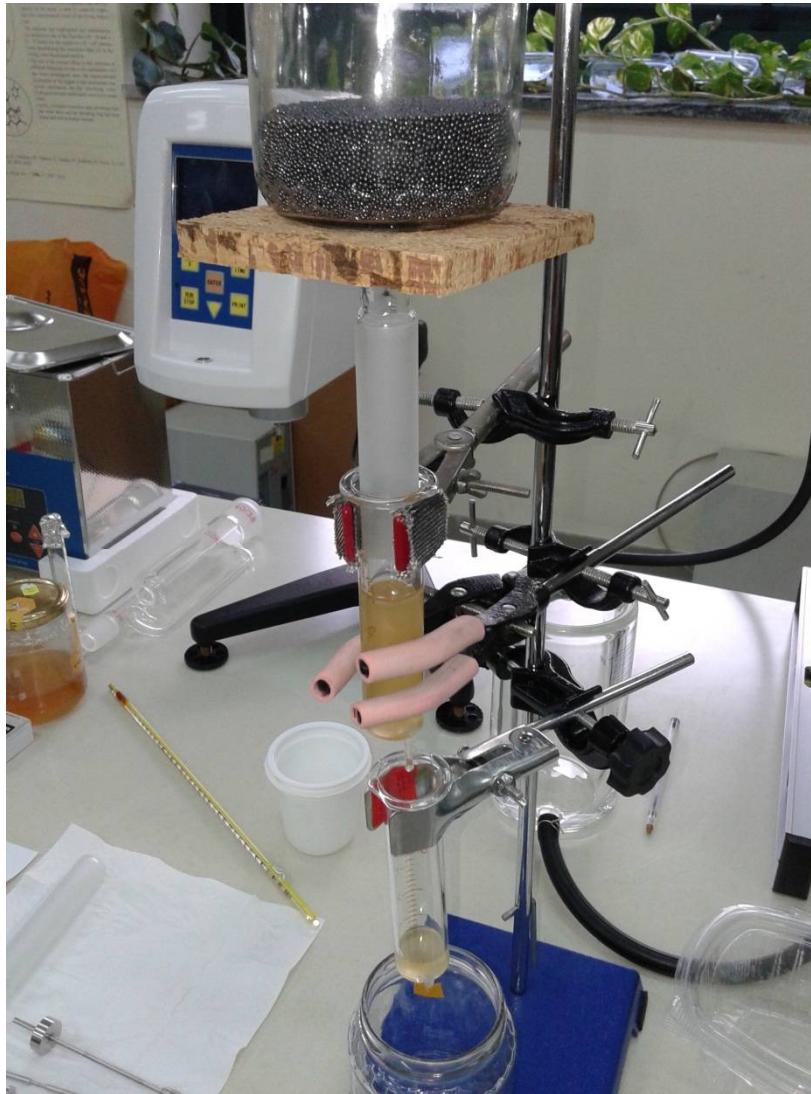
Poiseuille equation

$$\eta [Pa \cdot s] = \frac{\pi \cdot R^4 [m^4] \cdot \Delta p [N \cdot m^{-2}]}{8 \cdot L [m] \cdot Q [m^3 \cdot s^{-1}]}$$

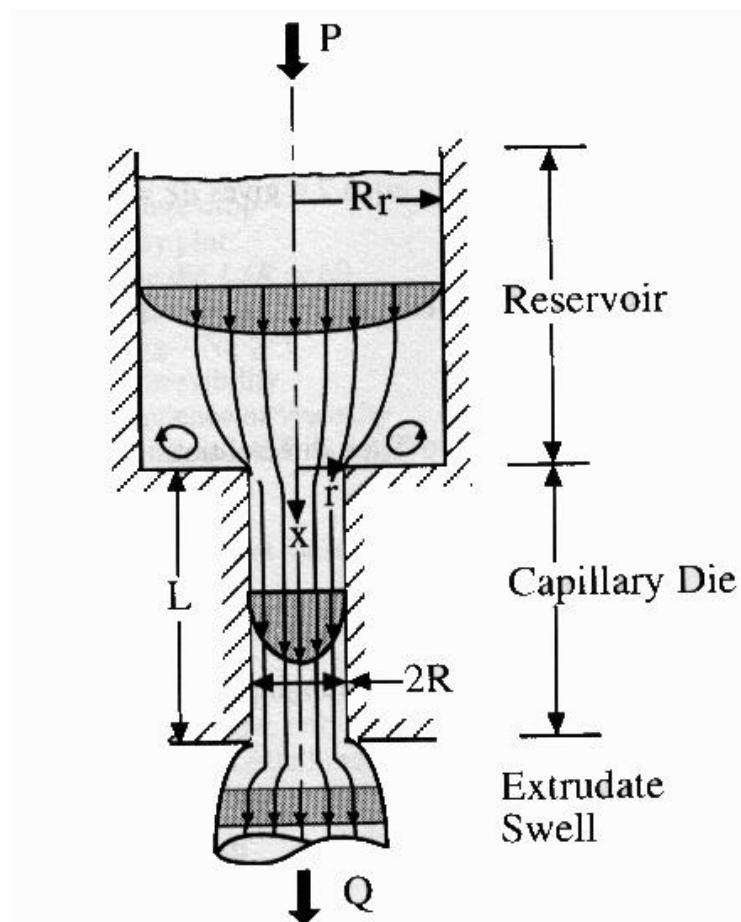
Poiseuille equation

$$\eta [Pa \cdot s] = 0.243 \cdot \frac{(0.031 + M) [kg]}{Q [mL \cdot s^{-1}]}$$

Viscosimetro a capillare homemade



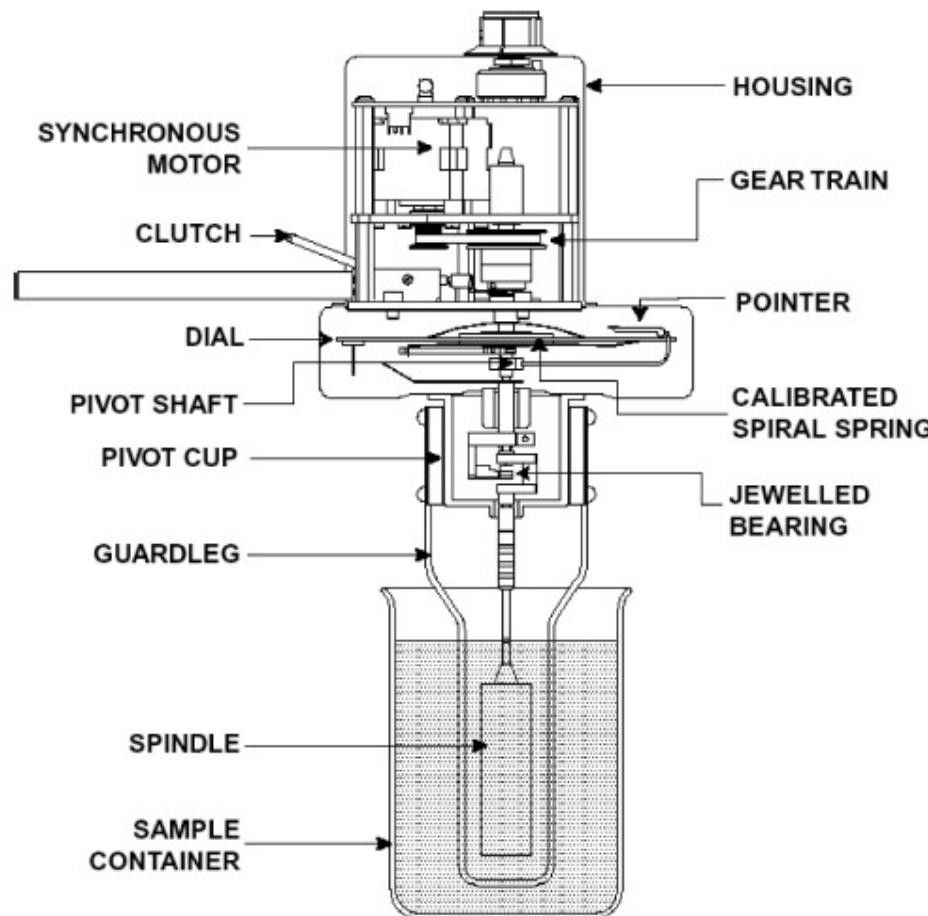
Flusso all'imbocco del capillare



Brookfield viscometer

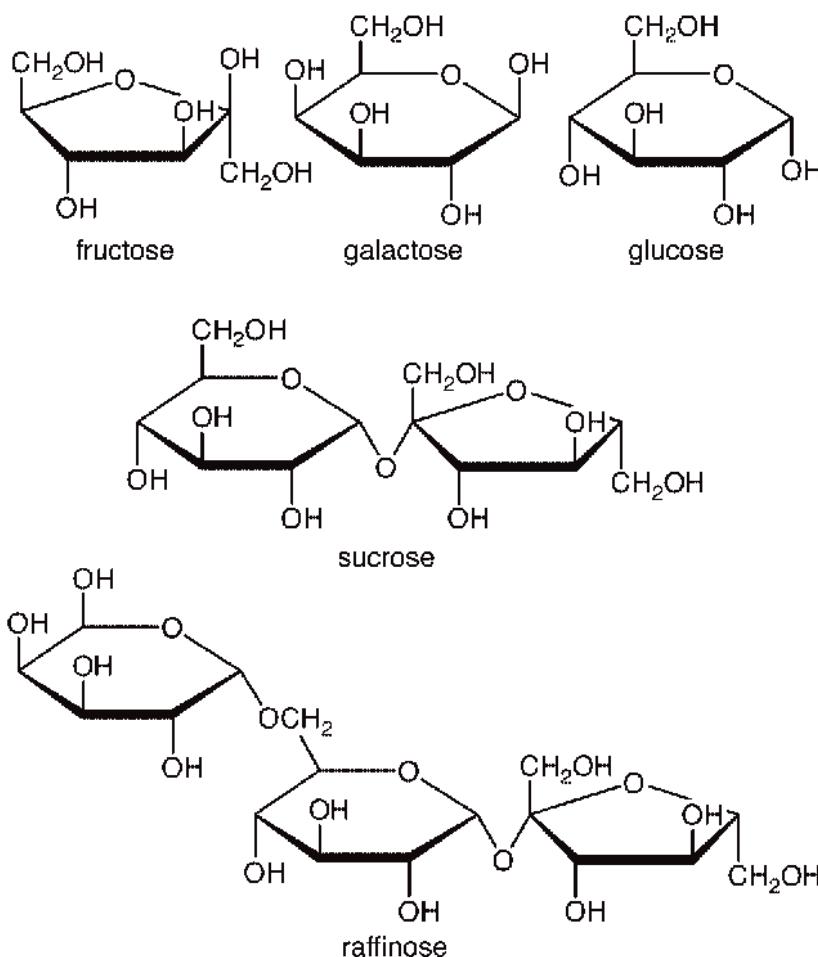


Schema del viscosimetro rotazionale Brookfield

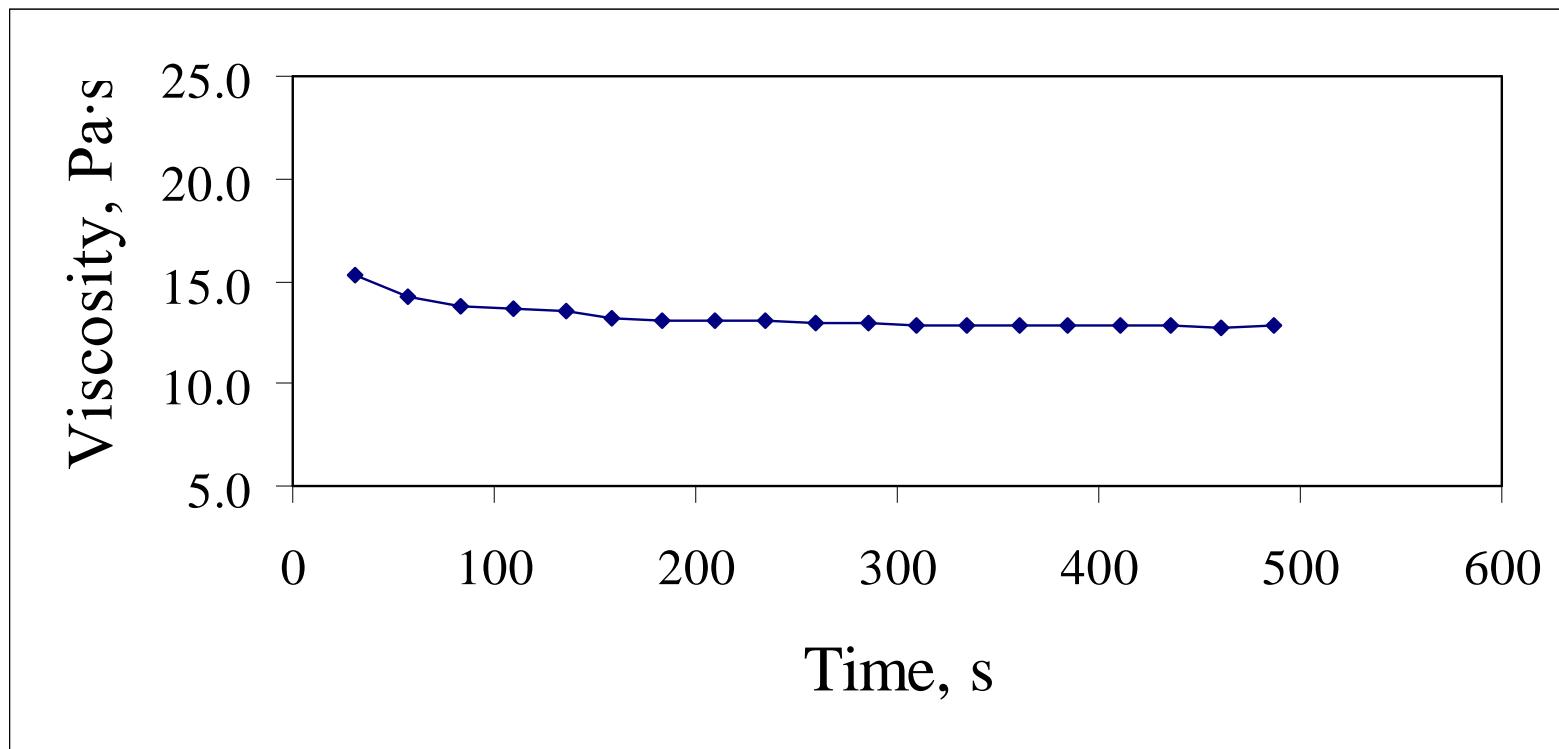


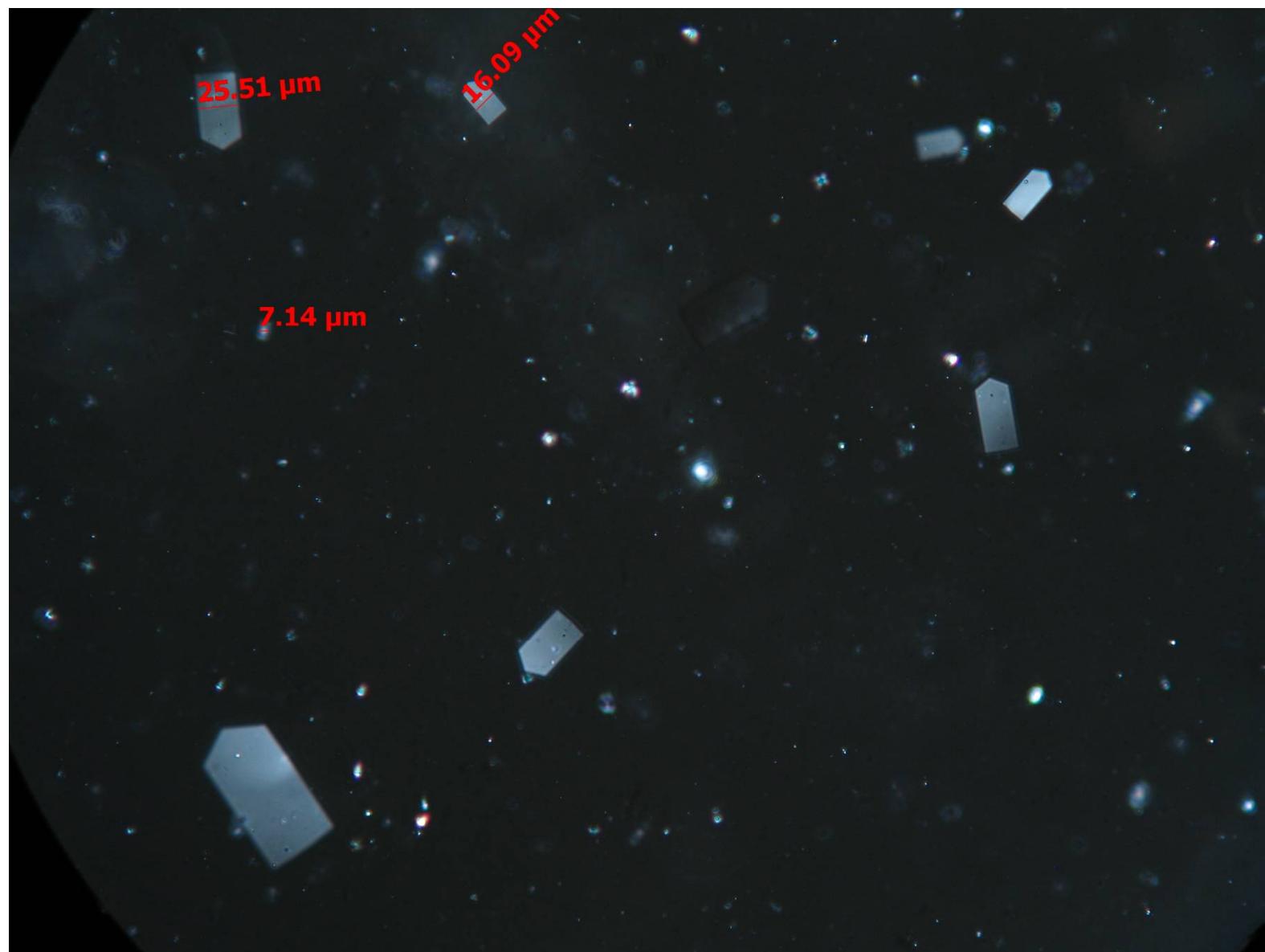


Molecular structures of some sugars most commonly found in honey

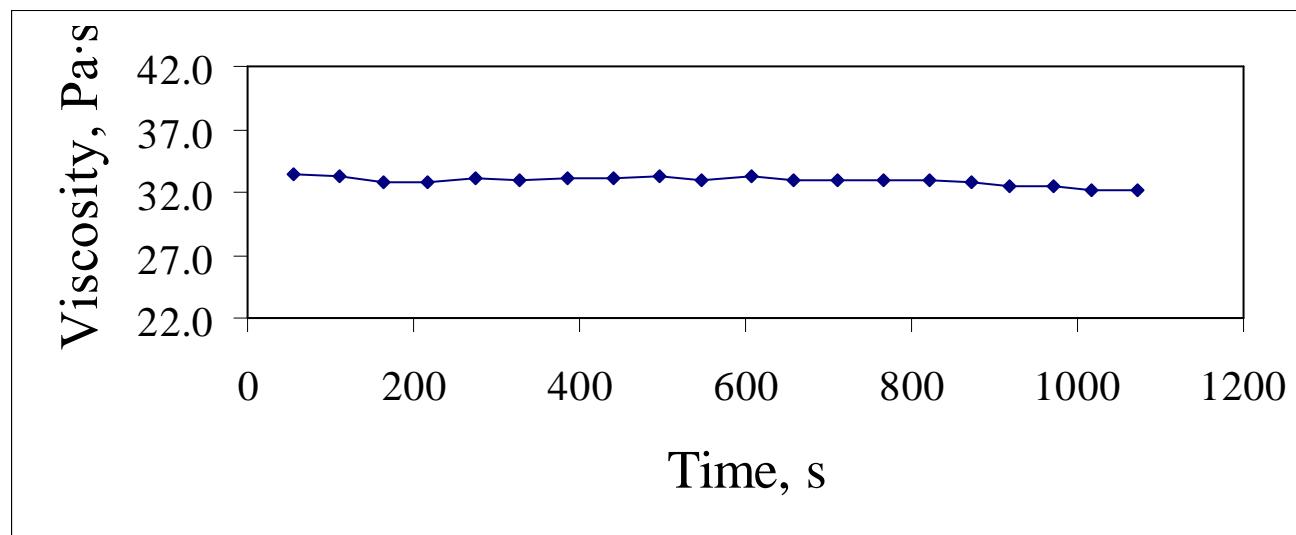


Acacia

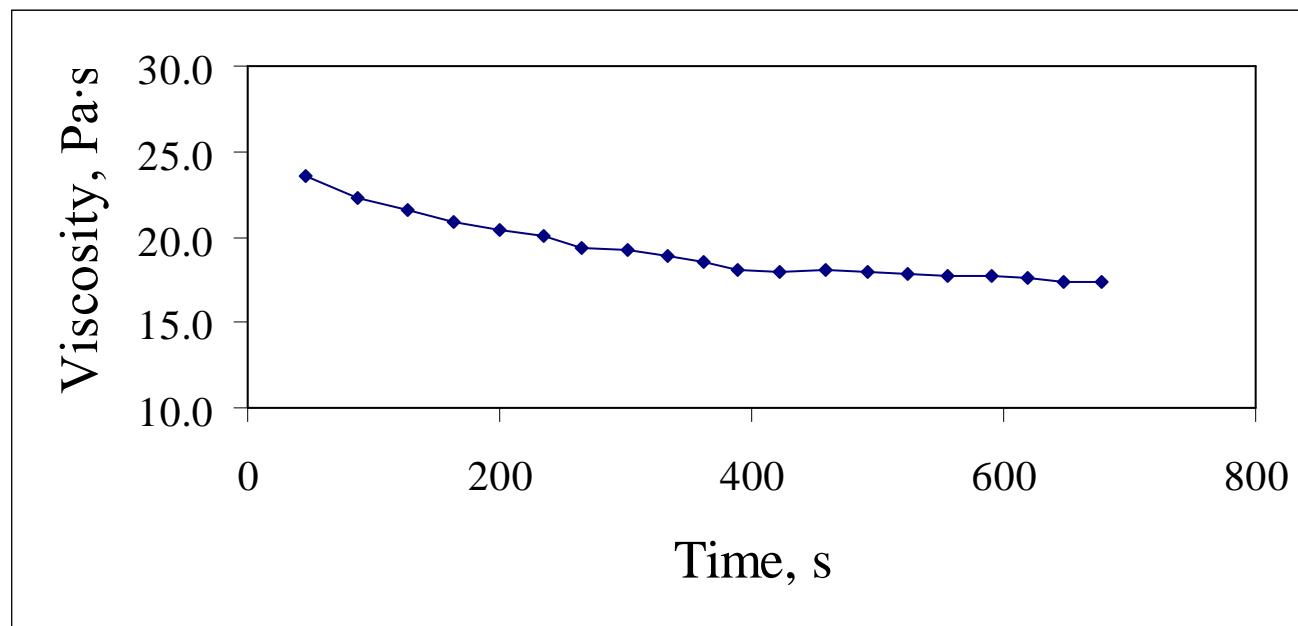




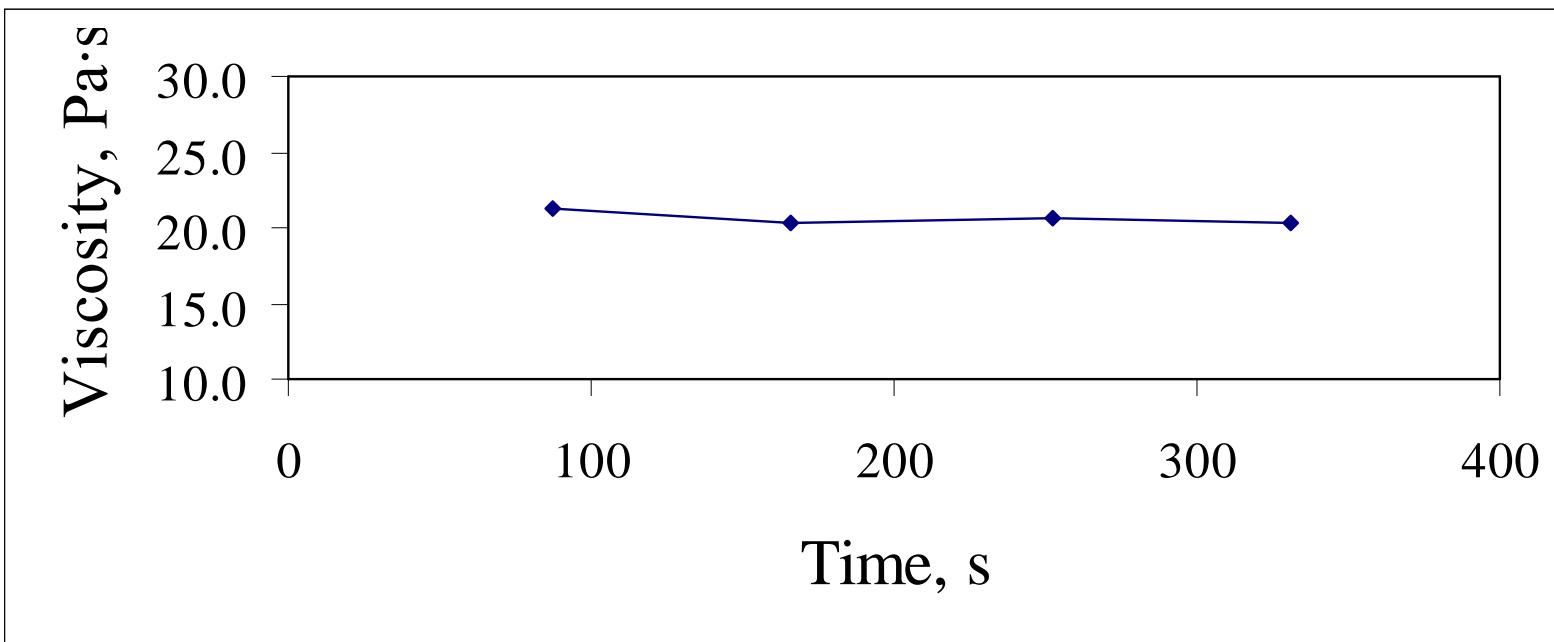
Aged acacia



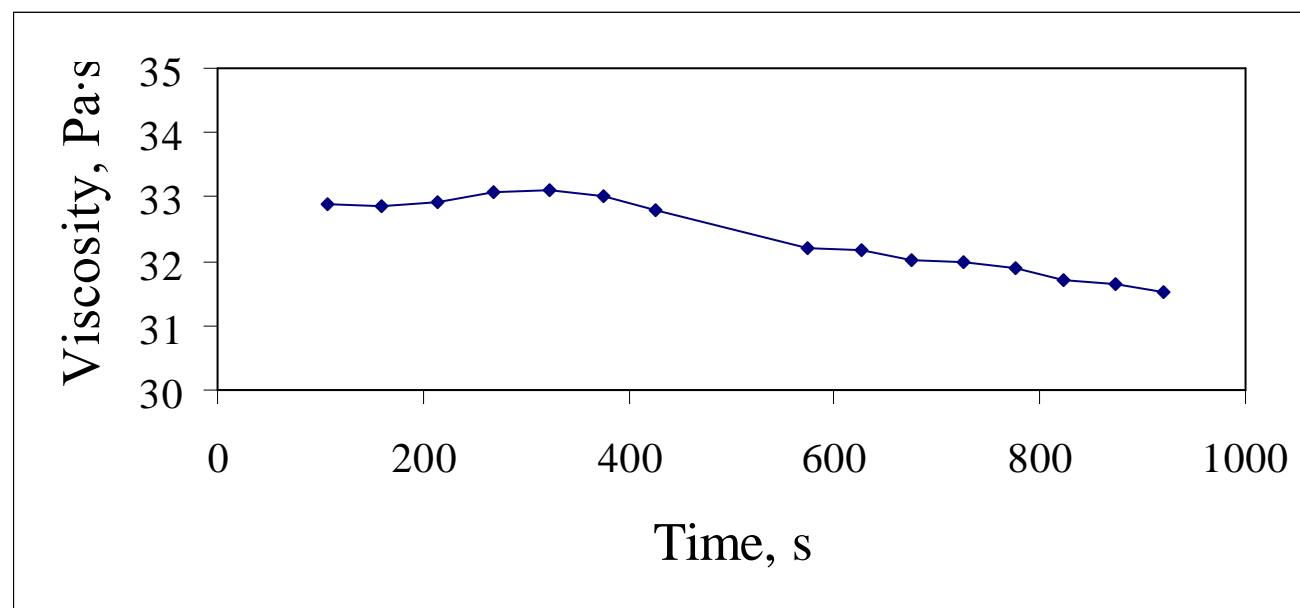
Aged chestnut



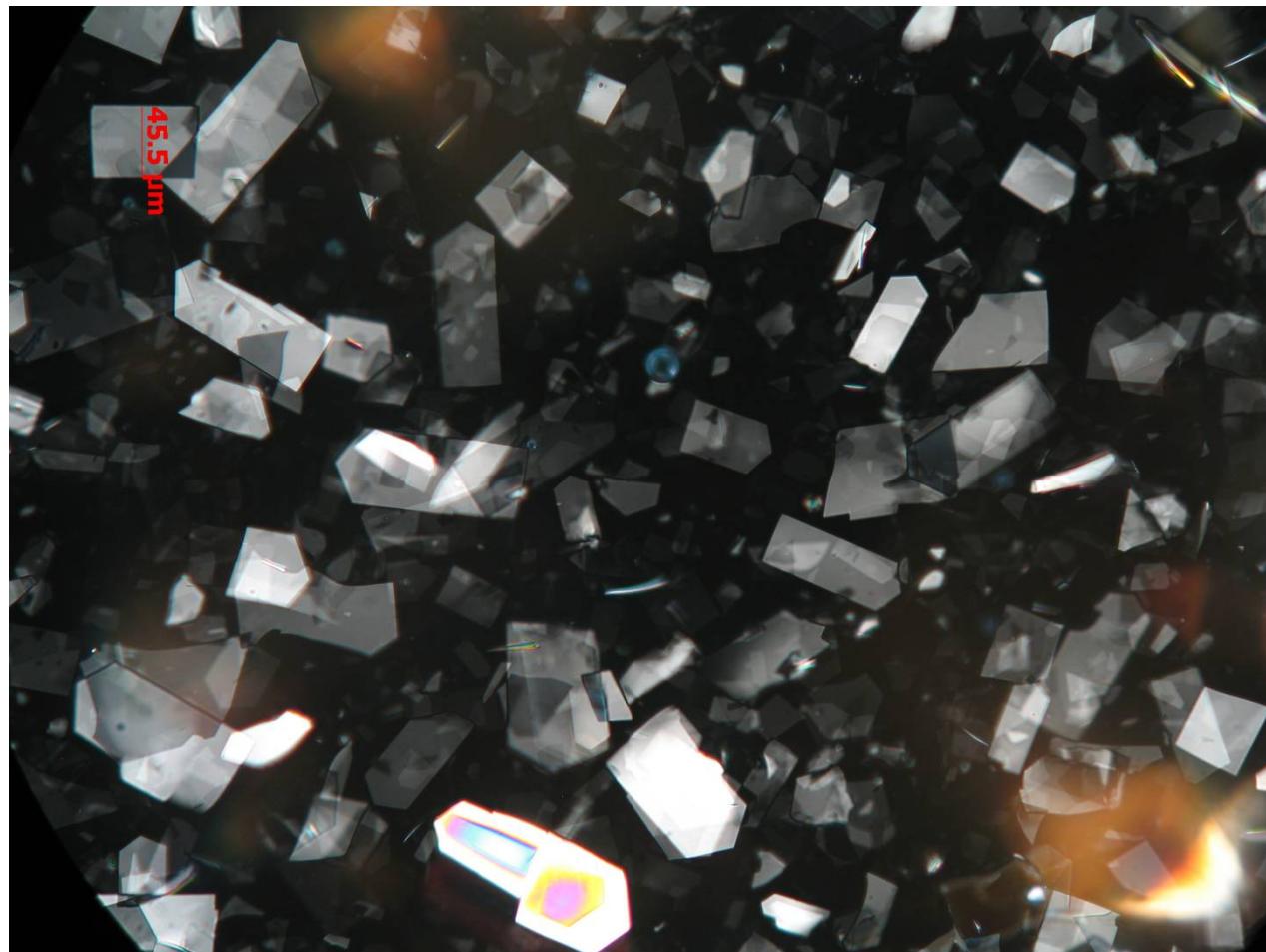
Sulla



Semi-crystallized Sulla ($T = 22 \text{ } ^\circ\text{C}$)



Micro-fotografia Sulla semi-cry

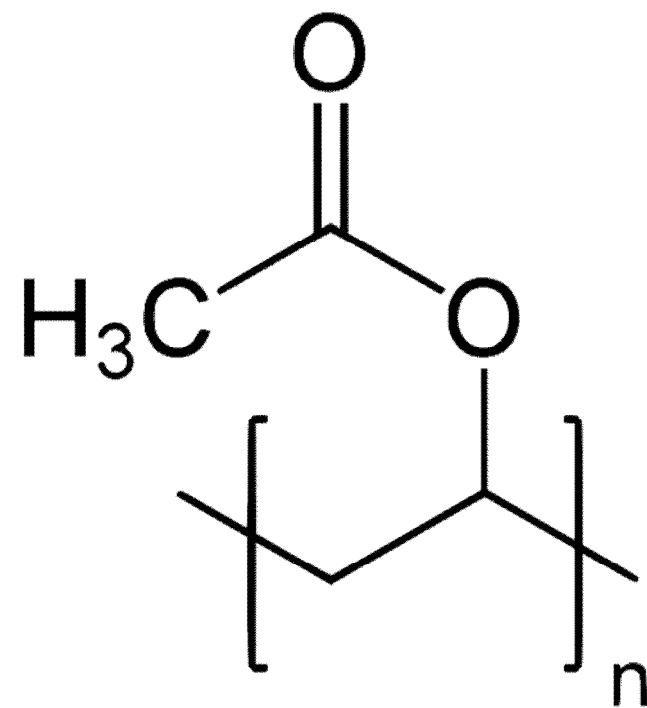


Honey	Acacia	Aged acacia	Sulla	Semi-crys Sulla	Aged Chestnut
Capillary (η , Pa·s)	13.2	32.9	20.7	32.4	19.1
Brookfield (η , Pa·s)	12.8		20.0	47.0	

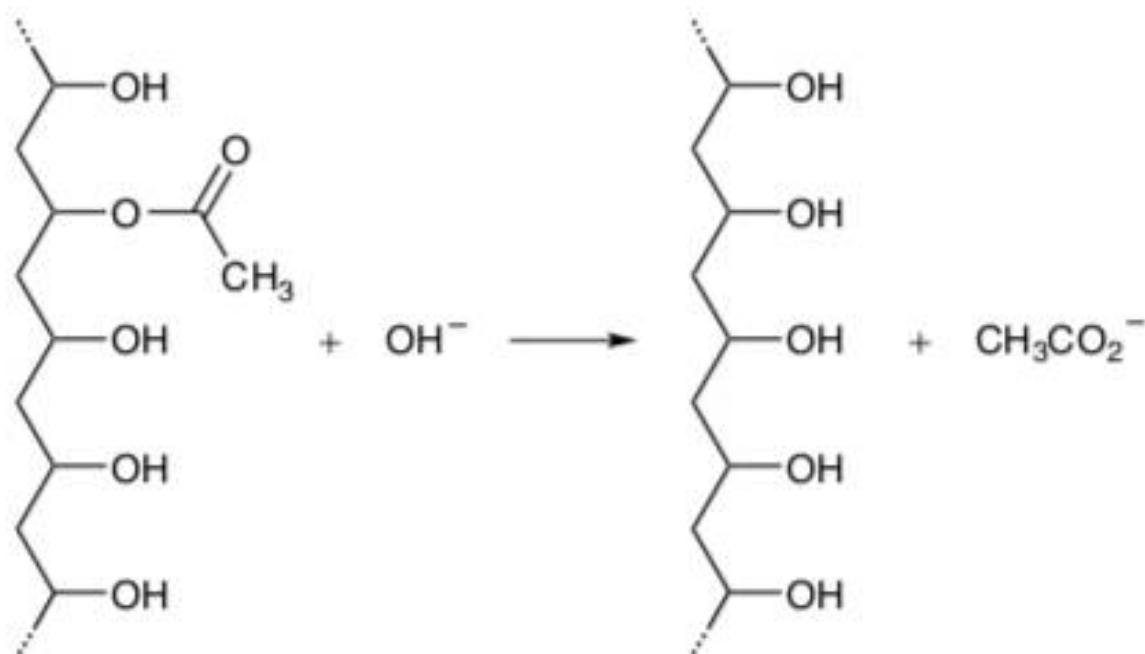
Colla vinilica



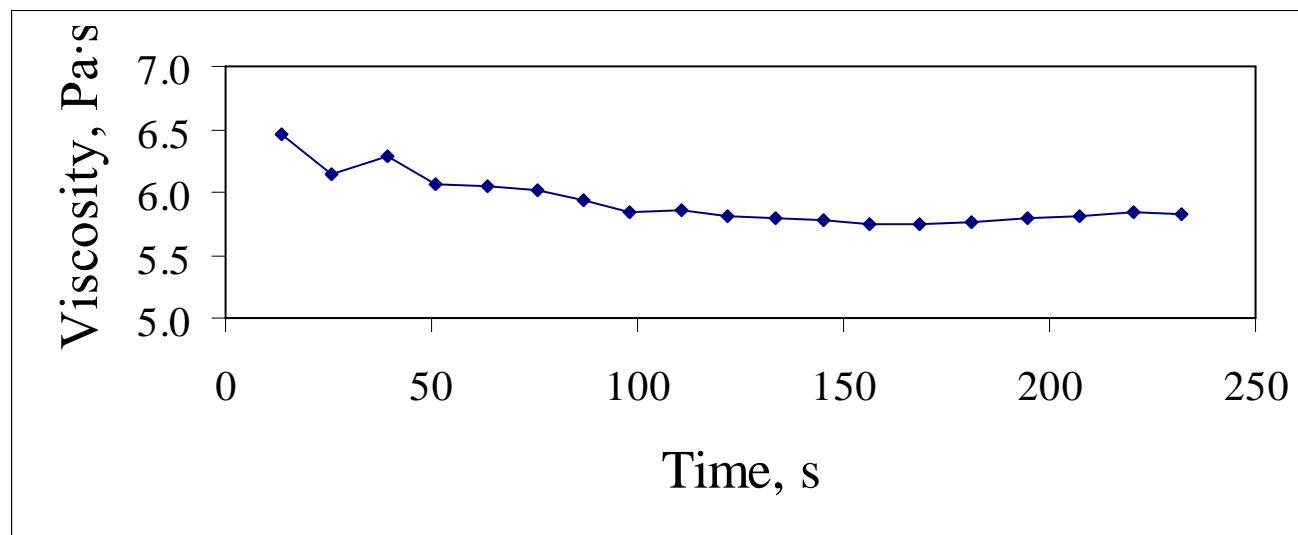
Struttura molecolare del PVAc



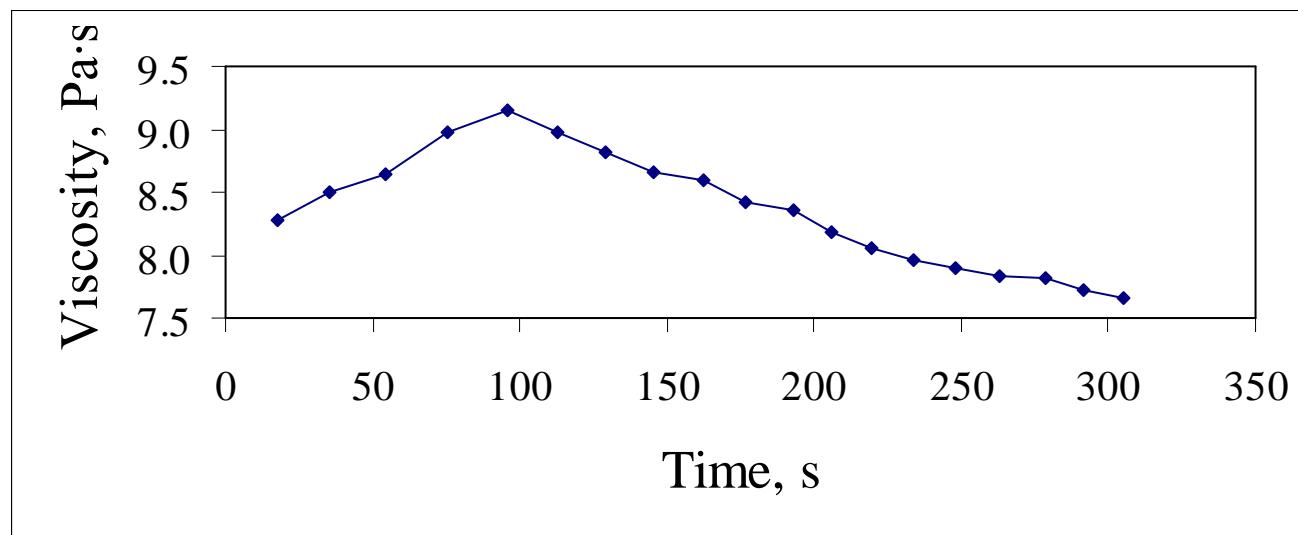
L'idrolisi basica del PVAc produce
polivinil alcol e acetato



Vinavil tal quale, 23.5 °C

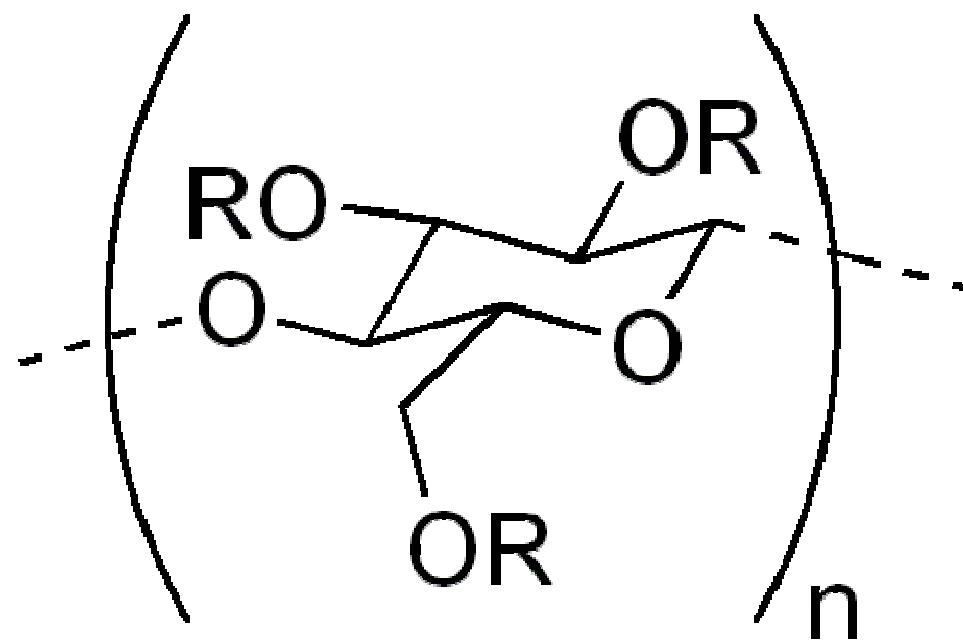


Vinavil reticulato (4 h), 23.5 °C



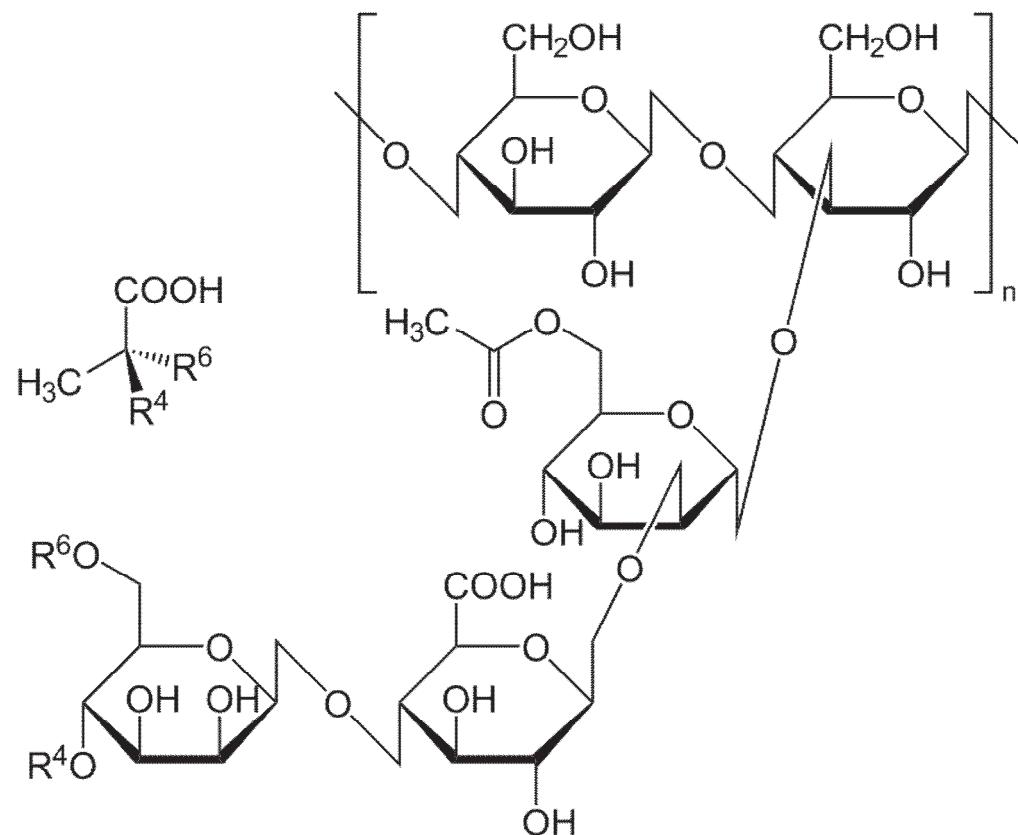


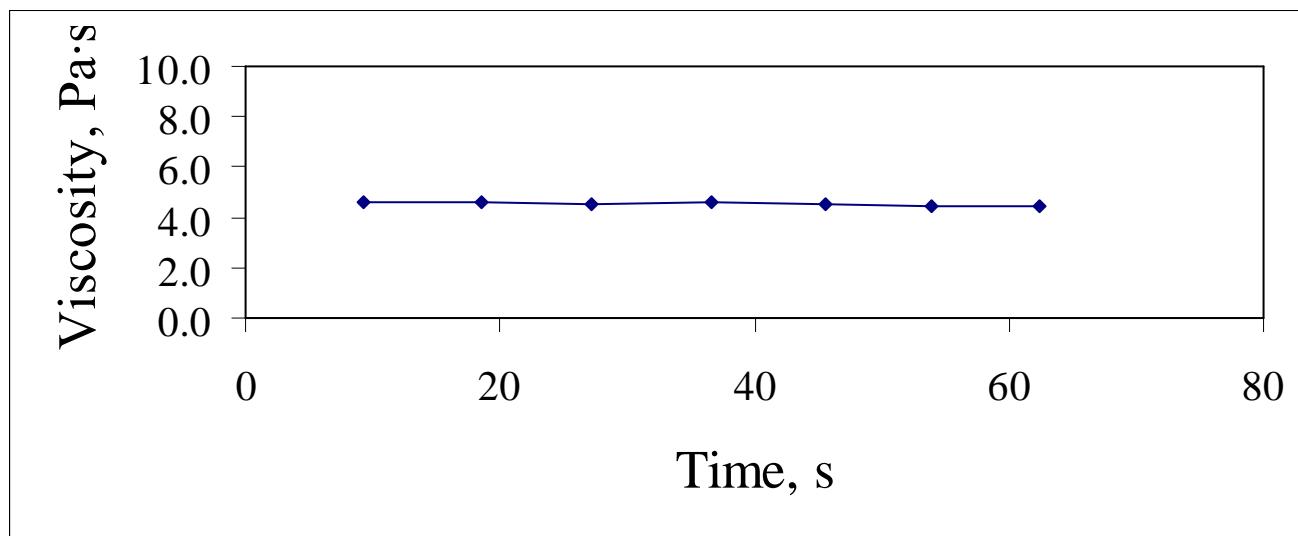
Cellulose gum (carboxymethyl cellulose)



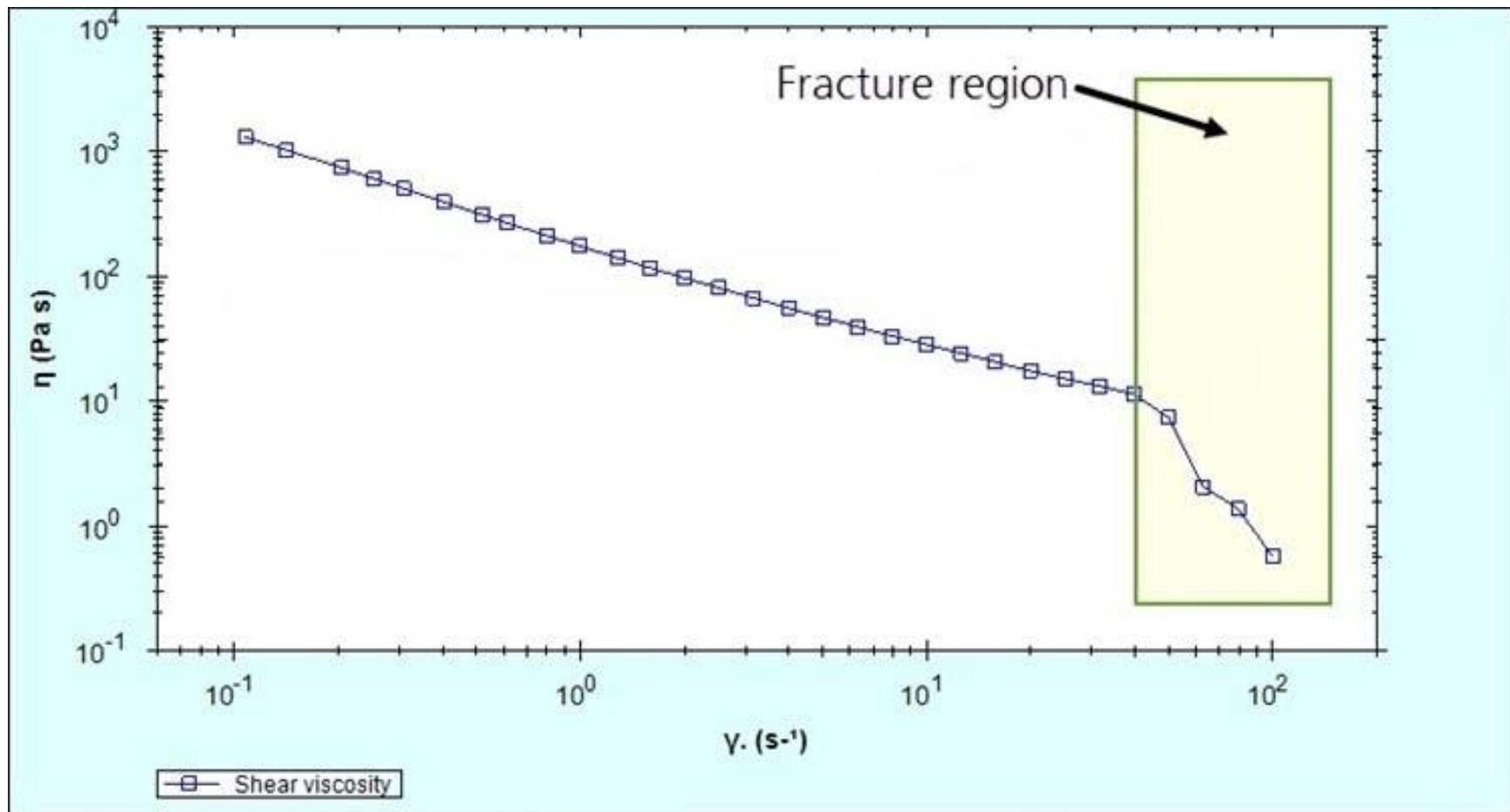
$\text{R} = \text{H}$ or $\text{CH}_2\text{CO}_2\text{H}$

Xantham Gum





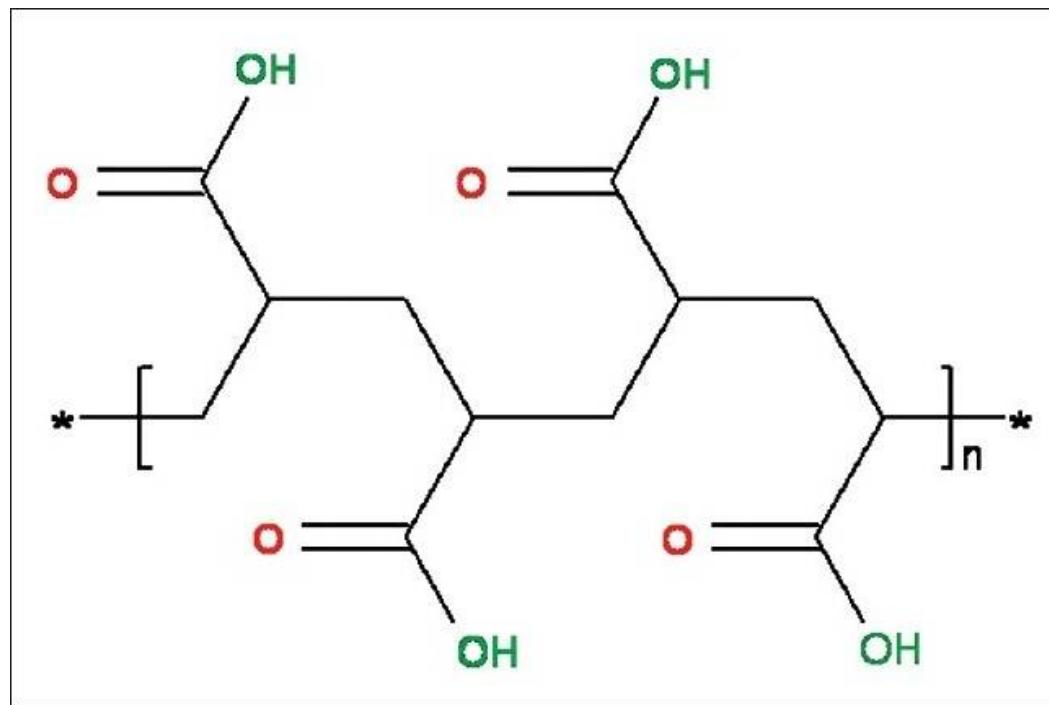
Flow curve for a typical toothpaste



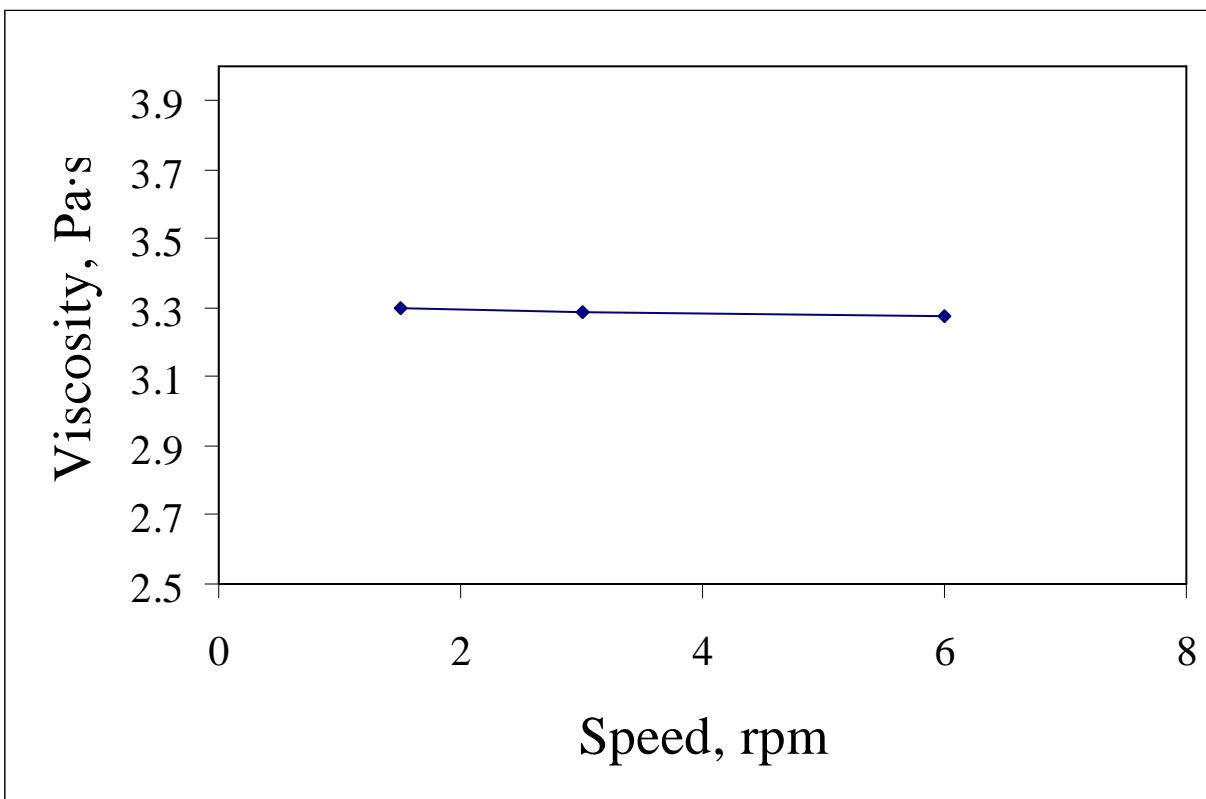
Liquid dishwasher



Carbopol (Polyacrylic acid)



Manual Dishwashing Gel ($T = 22 \text{ } ^\circ\text{C}$)



The Kaye Effect

