

Characterizing Emulsions

Now we will explore the different types of emulsions and their distinct physical characteristics. Here are a few of the metrics that scientists use to characterize an emulsion. For each group, choose 2-3 samples from A-E, and fill out the **Observation Table** as you begin your work.

Emulsion State

- Is your sample uniformly emulsified?
- Do you see pockets of water/oil/soy lecithin?
- Do you see oil layers forming?

Color

- Try putting in different dyes in your sample and compare the colors of different samples.
- Oil Red O
- Blue Dye

Texture

- Is your sample sticky?
- Is your sample watery?
- Is your sample in between the two?

Viscosity

- How sticky is your sample?
- **How do we measure this?**

Viscosity Test

Material: Samples, Your Lotion

Equipment:

- Pipette stand
- Consistometer Paper
- Pipette
- Pen

Protocol:

1. Using a pipette, obtain the sample.
2. While tilting the pipette stand so the incline part becomes **parallel** to the floor, drop appx. 2-3 droplets of each sample on top of the four purple dots (to fit the dot).
3. Angle the surface to begin the experiment while simultaneously

starting the timer for **30** seconds, and mark/record how far the sample goes at the end of the 30 seconds.

4. Take the multiplicative inverse (1/distance) of the distance traveled to approximate viscosity.
5. Record the viscosity category according to the standards below (in units of cm⁻¹).
 - <0.2 : Low Viscosity
 - 0.2-.0.5: Medium Viscosity
 - >0.5: High Viscosity
6. Repeat steps 1-5 for your **lotion**.
7. Compare viscosity values with other groups and your lotion. What can you hypothesize about the relationship between viscosity and emulsion state?

Other Metrics

- What other metrics can you think of that will be useful in characterizing the emulsions?
