Viscosity

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What is Viscosity?

Viscosity is a physical property of fluids that demonstrates resistance to flow. Viscosity is caused by intermolecular forces between particles, which create friction in the fluid. This friction denotes the thickness and ease of flow of a liquid

For example:

- Honey has a higher viscosity than water due to more friction and cohesion between the molecules.
- Does viscosity increase or decrease in higher temperature?

- Different fluids flow at different speeds when the same amount of force is applied
- If lava and water flow down a slope, which will reach the bottom first, and why?

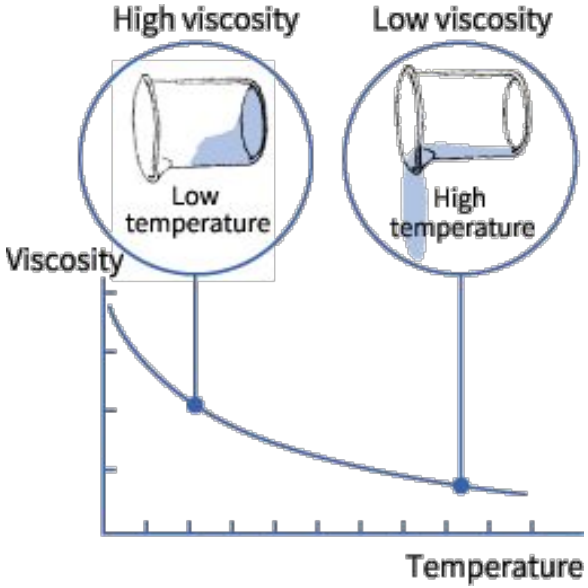
Viscosity & Temperature

Viscosity and temperature are relative variables:

- When temperature increases, viscosity decreases
- When temperature decreases, viscosity increases

This is due to faster molecules at higher temperatures. The viscosity of a fluid depends on the cohesive force of its molecules, so when temperature increases, viscosity decreases.

Cohesive: To stick together or stay together



Viscosity & Lava

Lava is a highly viscous fluid, as it has a high resistance to flow.

- Lava is 100,000 times more viscous than water
- Why is lava's viscosity much higher than the viscosities of water and oil?

Viscosity & Motor Oil

Different types of motor oils come with different levels of viscosity.

- Less viscous motor oil will flow faster
- More viscous motor oil will flow slower

Why would the viscosity of certain oils be important?

Viscosity & Maple Syrup

Maple syrup can be used to show the relationship of viscosity and temperature.

Have you ever tried making a maple syrup taffy?

- The first step is to boil the syrup to approx. 113 degrees c
- Next, you pour the syrup on top of some ice or snow, take a popsicle stick and roll the taffy around the stick

What do you think happens when the temperature of the syrup is increased? Does it become more or less viscous?

Why do you think the steps instruct to pour the syrup on to snow?

Why is Viscosity Important?

Viscosity, like many other scientific concepts, are important to know in real life.

Viscosity is important when:

- There is any process involving fluid flow
- Choosing the correct kind of oil for motors, lubrication, etc.
- Timing of liquids, such as how long it will take for a reservoir to fill
- Energy required to pump or process certain fluids
- Determining the structure of molecules

The Hoover Dam

Summary

- Viscosity is the physical property of fluids that shows resistance to flow
- Viscosity is affected by heat
- It is caused by the friction of intermolecular force
- Lava has a high viscosity because its molecules have a high melting point
- The viscosity of certain oils is important for lubrication and operating engines
- Viscosity is also important for things such as the timing of liquids and the amount of energy required to process them.

Thank You