

# **Chapter 17**

# **Properties of Matter**

## **Section 17.4**

## **Viscosity of Fluids**

# Viscosity of Fluids

- A measure of a material's resistance to flow. (centipoise)
- High-viscous fluids take longer to pour from containers.
- Which is more viscous?

V8 Juice



or

ketchup



# Why does viscosity matter?

■ Important in food production.



■ Important in motor oils.



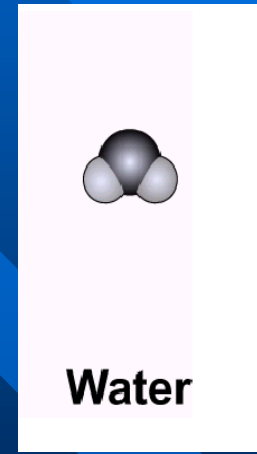
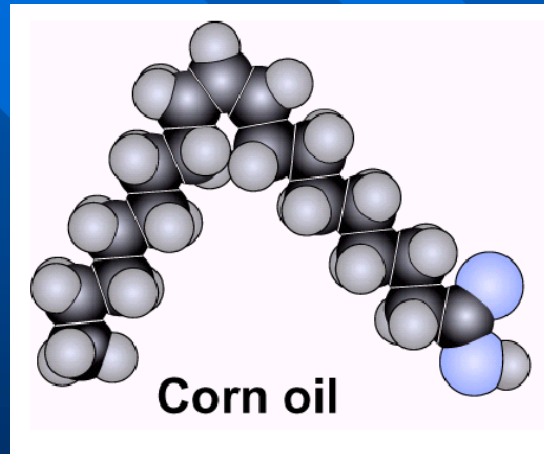
■ Important in drilling fluids.



# Why are some liquids more viscous than others?

- Viscosity is primarily determined by the shape of the liquid's molecules.

**Large, bumpy molecules  
cause more friction than  
small, smooth molecules.**



*Here are diagrams of two  
molecules. Which liquid is likely  
to have a higher viscosity?*

# **Viscosity of a liquid decreases with an increase in temperature**

- So, fudge is easier to pour when it's hot.



# **Why does this happen?**

- **When energy (heat) is added to a liquid, the molecular movement (speed) increases and the temperature rises.**

- **This extra speed allows the molecules to slide past each other more easily.**
- **Thus viscosity decreases.**



# **Gases exhibit the opposite property.**

- **Viscosity of a gas increases as the temperature rises.**
- **Why?**

**Raising the temperature of a gas increases the number of collisions between molecules, thus friction increases. As a result, viscosity increases.**