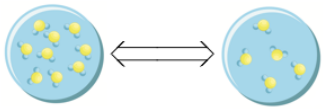
**CONCEPT:** INTERMOLECULAR FORCES & PHYSICAL PROPERTIES

- Recall, the physical properties are measurable and observed through the senses that describe the _____ of matter.
  - □ Intermolecular forces are _____ forces that exist between molecules and influence physical properties.

## Direct Relationships

- Under direct relationships, the stronger the intermolecular force then the _____ the physical property.

**Intermolecular Forces (Physical Properties)**

| Boiling Point (BP) | Melting Point (MP) | Surface Tension | Viscosity |
|---|---|---|---|
| Temperature where a ___ & ___ are in equilibrium.  | Temperature where a ___ & ___ are in equilibrium.  | Measure of _____ forces on a liquid surface.  | At constant T, the _____ to flow for a susbtance.  □ ___ viscosity = _____ movement □ ___ Temperature = _____ viscosity |

**EXAMPLE:** Which of the following compounds would have the **highest** melting point?

a) $C_2H_5OH$ b) CaS in $H_2O$ c) $CH_2Br_2$ d) $CH_3CH_2CH_3$

## Indirect Relationships

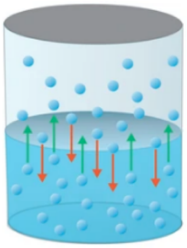
- Under indirect relationships, the stronger the intermolecular force then the _____ physical property.

**Intermolecular Forces (Vapor Pressure)**

Vapor Pressure

The pressure exerted by a _____ at the surface of a liquid

☐ An equilibrium between _____ & _____



**EXAMPLE:** Choose the substance with the **highest** vapor pressure.

a) $AgClO_4$ in $CH_3OH$ b) Kr c) $CH_4$ d) $H_2S$

**CONCEPT:** INTERMOLECULAR FORCES & PHYSICAL PROPERTIES

**PRACTICE:** Which of the following will have the **lowest** boiling point?

a) $CH_3–O–CH_3$ b) KI c) $C_6H_5OH$ d) $C_6H_{14}$ e) $C_{60}$

**PRACTICE:** Which molecules would most likely cause a liquid to have the **lowest** viscosity?

a) Large, polar molecules

b) Small, nonpolar molecules

c) Small, polar molecules

d) Large, nonpolar molecules

**PRACTICE:** Which of the following should have the **highest** surface tension at a given temperature?

a) $CH_4$ b) $CF_4$ c) $CCl_4$ d) $CBr_4$ e) $CI_4$