

Cycle 2 Chemistry I Lesson 2

Identify and Contrast the 6 Changes of Physical State

LAB TOMORROW! DRESS ACCORDINGLY!

Agenda:

Vocab: Evaporation, Condensation, Melting, Freezing,
Sublimation, Deposition

Problem p.384 #3,5,6, (H8)



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Changing States

- Most substances can undergo six changes of state: freezing, melting, evaporation, condensation, sublimation, and deposition.

Temperature, Energy, and State

- Generally, adding energy to a substance will increase the substance's temperature.
- But after a certain point, adding more energy will cause a substance to experience a change of state instead of a temperature increase.



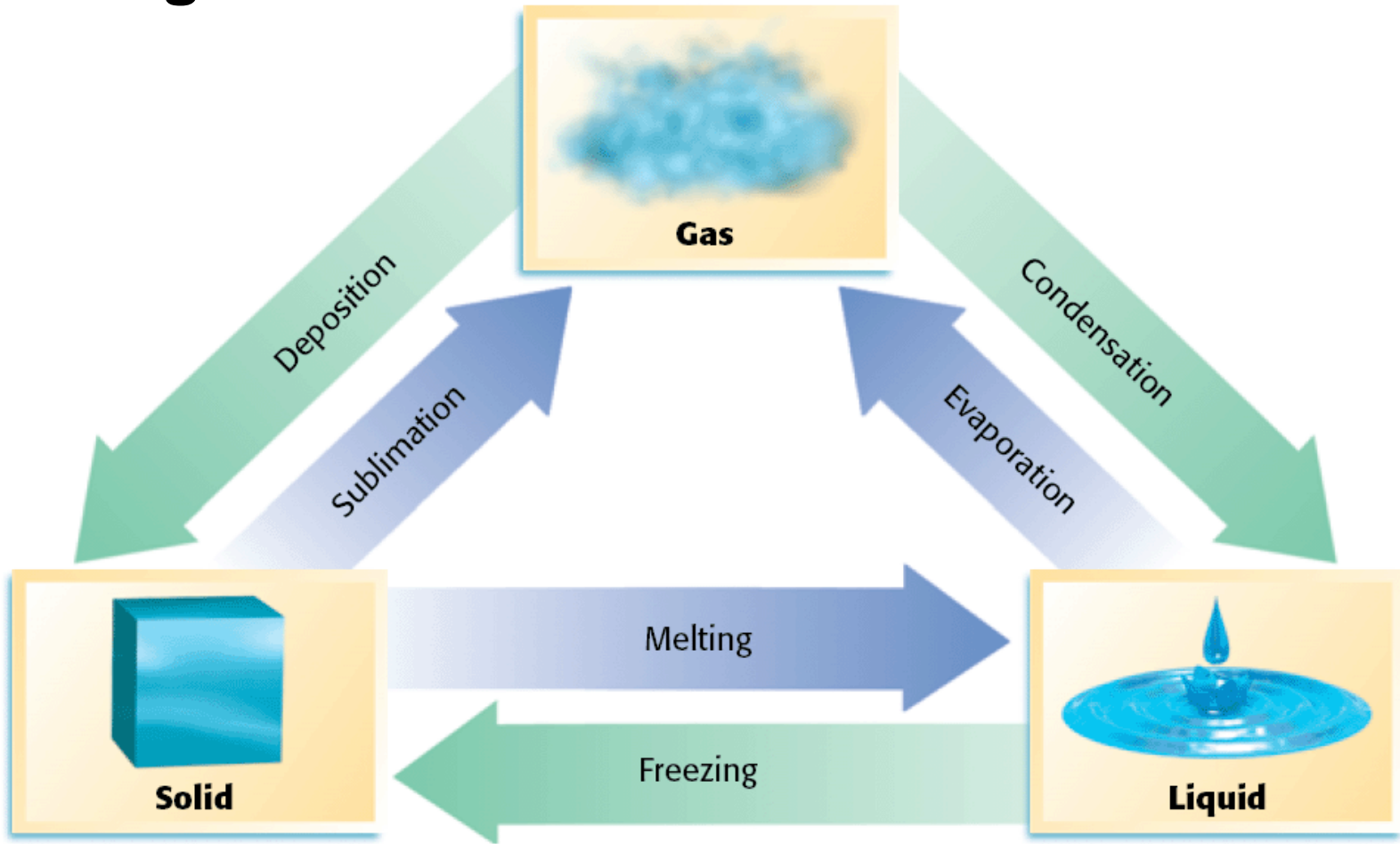
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Changes of State





Changing States, *continued* Liquid Evaporates to Gas

- Energy is required to separate liquid particles. They gain energy when they collide with each other.
- If a particle gains a large amount of energy, it can leave the liquid's surface and join gas particles.
- **Evaporation** is the change of state from liquid to gas. Evaporation is an endothermic process.
- **Boiling point** is the temperature and pressure at which a liquid and a gas are in equilibrium.



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Changing States, *continued* Gas Condenses to Liquid

- When gas particles no longer have enough energy to overcome the attractive forces between them, they go into the liquid state.
- **Condensation** is the change of state from a gas to a liquid. Condensation is an exothermic process.
- Condensation can take place on a cool night, causing water vapor in the air to form dew on plants.



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Changing States, *continued* Solid Melts to Liquid

- As a solid is heated, the particles vibrate faster and faster in their fixed positions.
- At a certain temperature, some of the molecules have enough energy to break out of their fixed positions.
- **Melting** is the change of state from solid to liquid. Melting is an endothermic process.
- **Melting point** is the temperature and pressure at which a solid becomes a liquid.



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Changing States, *continued* Liquid Freezes to Solid

- As a liquid is cooled, the movement of particles becomes slower and slower.
- At a certain temperature, the particles are pulled together into the fixed positions of the solid state.
- **Freezing** is the change of state from a liquid to a solid. Freezing is an exothermic process.
- **Freezing point** is the temperature at which a substance freezes.



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Changing States, *continued* Solid Sublimes to Gas

- The particles in a solid are constantly vibrating. Some particles have higher energy than others.
- Particles with high enough energy can escape from the solid.
- **Sublimation** is the change of state from solid to gas.
- Sublimation is an endothermic process.



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Changing States, *continued* Gas Deposits to Solid

- Molecules in the gaseous state become part of the surface of a crystal.
- When a substance changes state from a gas to a solid, the change is often called *deposition*.
- Deposition is an exothermic process.



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