

Chemistry

Chapter 10

Liquids and Solids

Section 2

Chapters:

10.2 The Liquid State

10.9 Phase Diagrams

Review

What are the three types of intermolecular forces?

Review

Rank the three types of intermolecular forces from strongest to weakest.

Review

Which intermolecular force will (most of the time) exhibit the highest boiling point?

Review

Which intermolecular force will (most of the time) exhibit the highest vapor pressure?

Review

What is the requirement for hydrogen bonding to occur between molecules?

Review

Name a few molecules with the strongest intermolecular force being London-Dispersion Forces.

Liquids

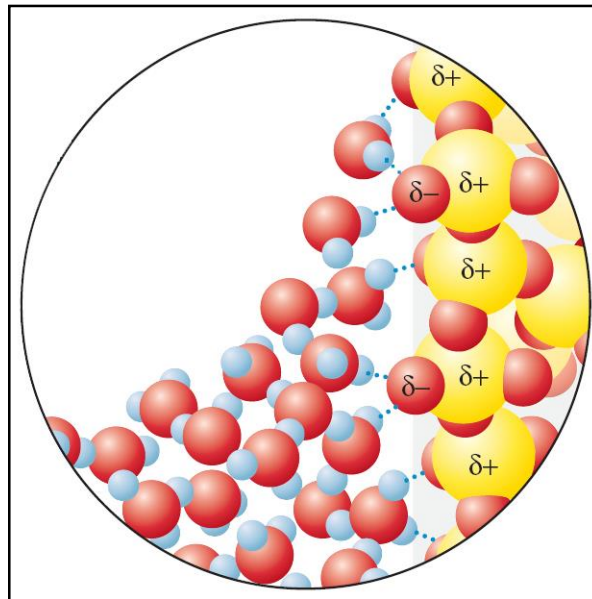
- defined volume; takes shape of the container
 - Liquids are fluids
 - Particles are closer together than gases
 - Higher density than gases
 - Relative incompressibility (low compressibility)
 - Liquids diffuse (if it can dissolve)
 - Viscosity – measure of a liquid's resistance to flow:
 - Liquids with large intermolecular forces or molecular complexity tend to be highly viscous.

Liquids

- Surface tension – resistance of a liquid to an increase in its surface area:
 - Liquids with large intermolecular forces tend to have high surface tensions.
- Capillary action – spontaneous rising of a liquid in a narrow tube:
 - Cohesive forces – intermolecular forces among the molecules of the liquid.
 - Adhesive forces – forces between the liquid molecules and their container.

Liquids

- Which force dominates alongside the glass tube – cohesive or adhesive forces?



adhesive forces

Solids

- defined shape and volume
 - Particles are closely packed (intermolecular forces)
 - Higher density than liquids (some exceptions)
 - Incompressible
 - Very low rate of diffusion

Solids

- Amorphous Solids:
 - Disorder in the structures
 - Glass
- Crystalline Solids:
 - Ordered Structures
 - Unit Cells

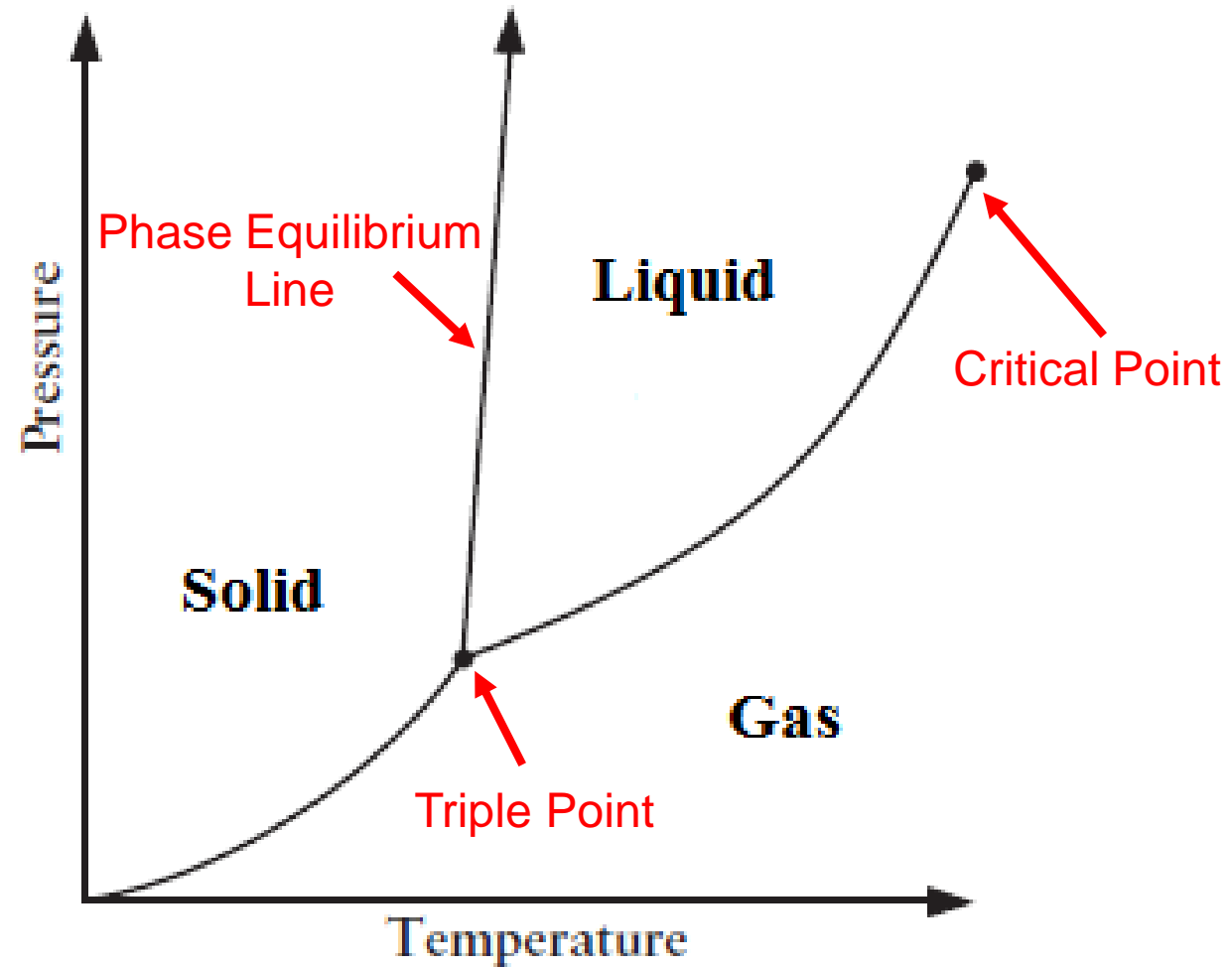
Phase Diagrams

- A convenient way of representing the phases of a substance as a function of temperature and pressure

Phase Diagrams

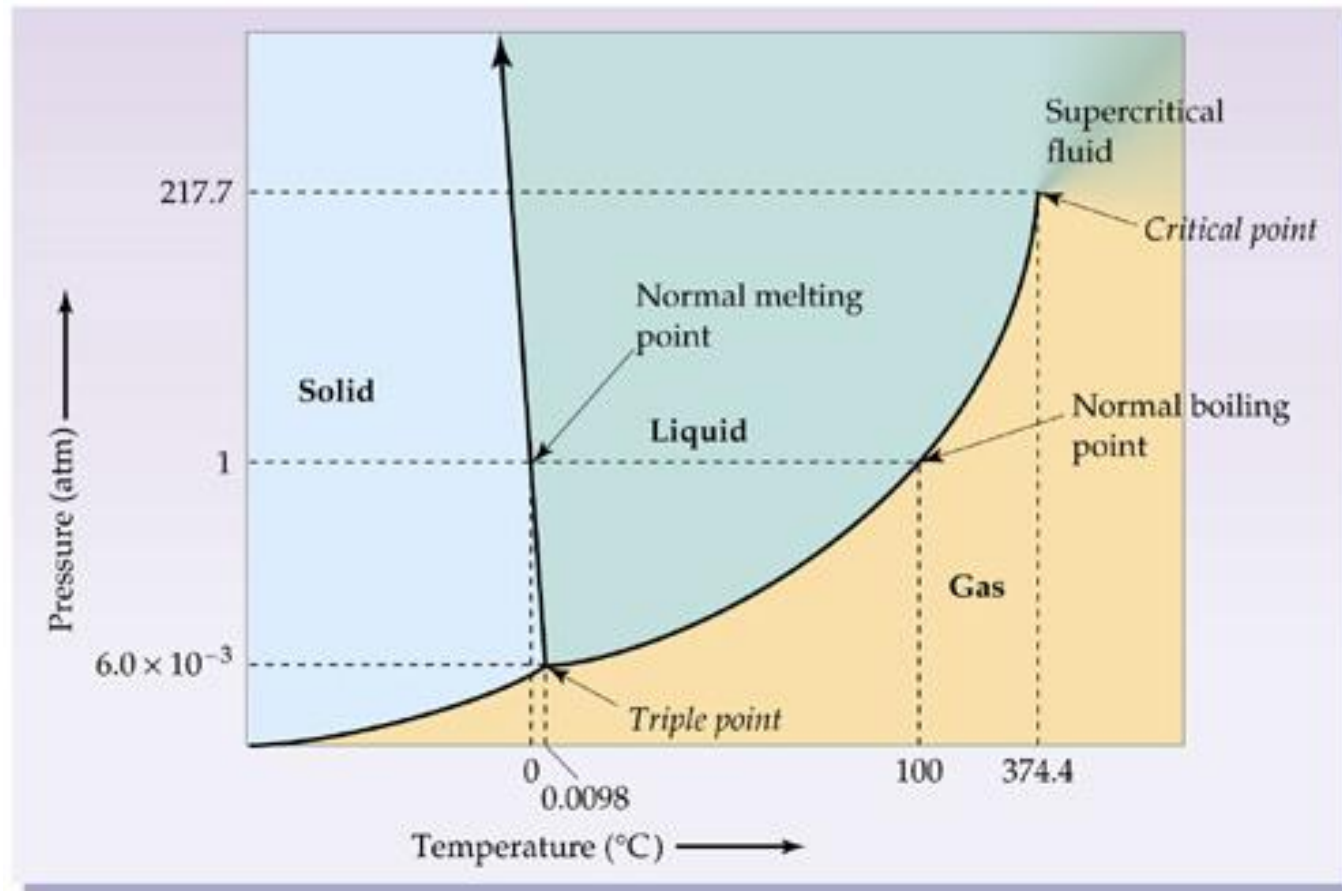
- Phase equilibrium lines - lines that mark conditions under which multiple phases can coexist at equilibrium; phase transitions (changes) occur along lines of equilibrium
- Triple point - the temperature and pressure at which the three phases coexist in thermodynamic equilibrium
- Critical point - the end point of a phase equilibrium curve

Phase Diagrams



Phase Diagrams

For H₂O

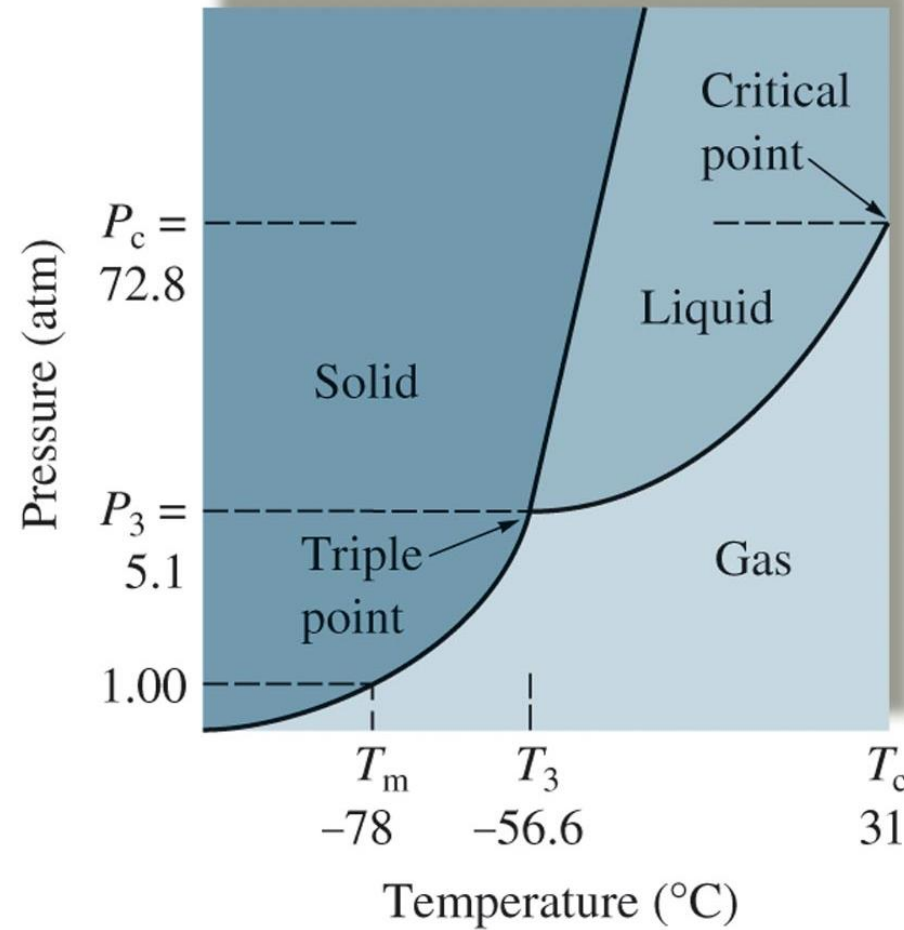


Phase Diagrams

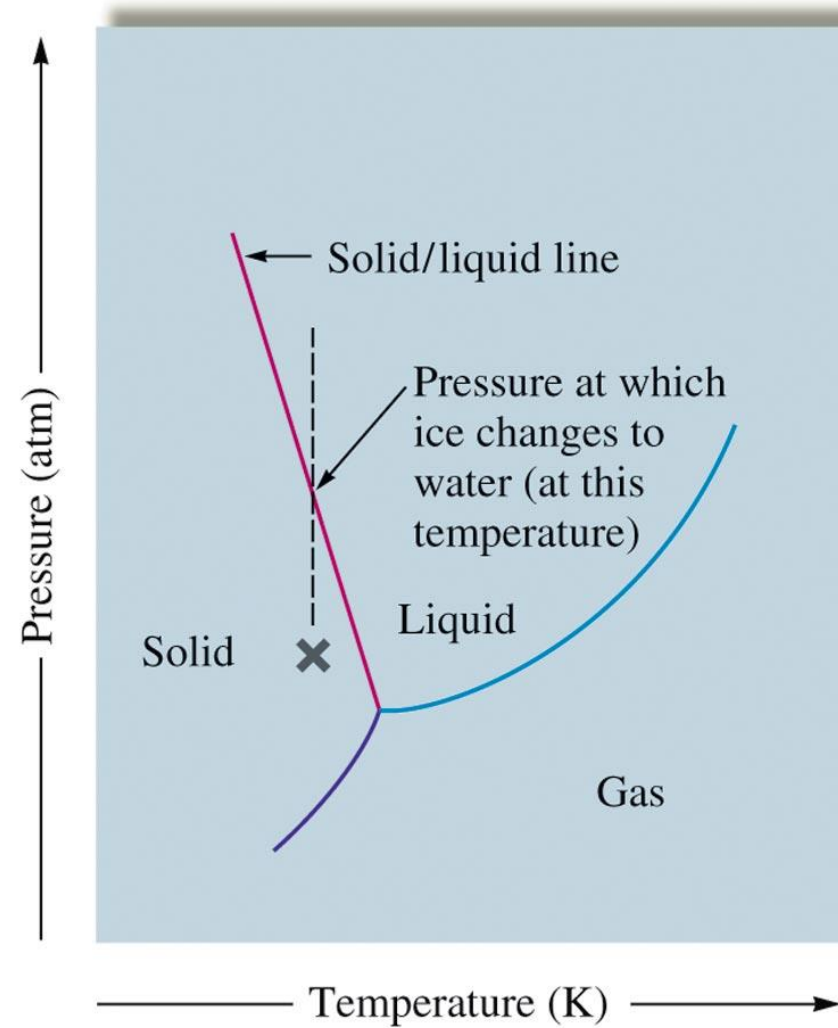


Phase Diagrams

For Carbon Dioxide



Phase Diagrams



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Homework: Pg 432h – 432i

Problems: Not Collected

131,132,138,140