Vapor Pressure & Phase Changes – Study Guide

*sections 10.3 and 10.4 in OpenStax*

**Vapor Pressure (section 10.3)**

How is the vapor pressure of a substance related to its Intermolecular Forces?

Referring to Example 10.5 in OpenStax:

Which liquid, diethyl ether or ethylene glycol, has the strongest intermolecular forces?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Which liquid has the highest vapor pressure? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Which liquid has the highest boiling point? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Boiling point and vapor pressure of a liquid are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (*directly, inversely*) proportional to one another.

*example*: Which of the following liquids would have the highest vapor pressure?

H2S H2O NH3 CO2 CH4

**Boiling Point (section 10.3)**

Explain briefly the difference between *boiling point* and *normal boiling point*.

How does the boiling point of a liquid change at higher elevations? Explain why.

**Phase Changes (section 10.3)**

What does ΔHvap represent? How is it related to Intermolecular Forces?

What does ΔHfus represent? How is it related to Intermolecular Forces?

**Phase Diagrams (section 10.4)**

A phase diagram is a graph of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the y-axis versus \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ on the x-axis.

The three regions present in a phase diagram represent \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The lines in a phase diagram represent \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The conditions under which a substance has all three states in equilibrium with one another is called the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

*example*: Referring to the phase diagram of carbon dioxide below:

Label the areas with the correct state of matter for each.

Label the fusion curve, the sublimation curve and the vaporization curve.

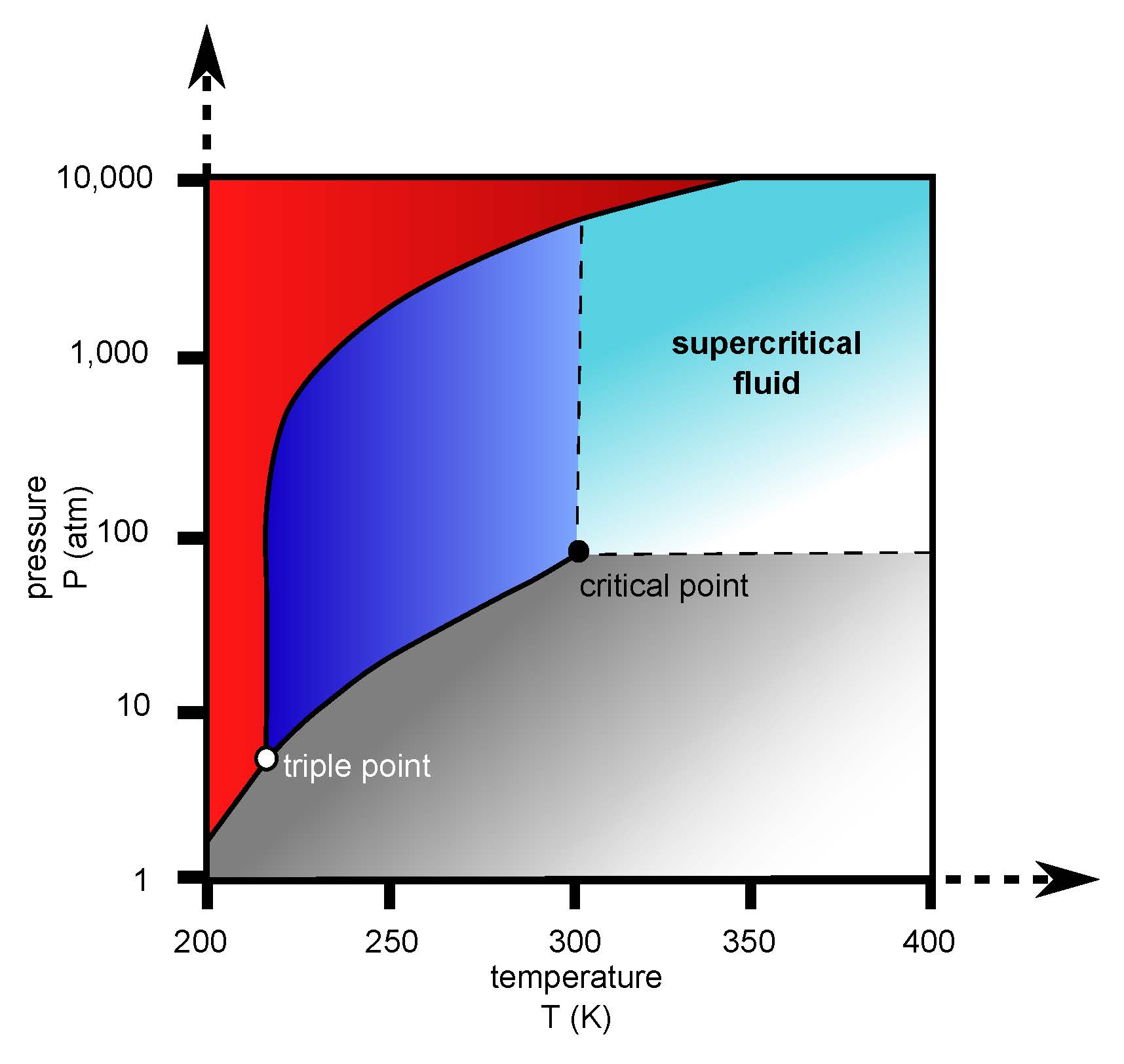
What are the pressure and temperature corresponding to the triple point: Pressure\_\_\_\_\_\_\_\_\_\_\_\_\_ atm, temperature \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_Kelvin

In what state does CO2 exist at 1 atm pressure and 298K?\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Suppose a sample of CO2 is at 5 atm and 250K. Describe all of the phase changes that

occur as the temperature is decreased to 200K but the pressure remains constant:

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_



**End of Chapter 10 Practice Problems**

#45, 50, 55, 63

For detailed solutions to these problems, go to the [OpenStax website](https://openstaxcollege.org/textbooks/chemistry/resources) and download the “Student Answer and Solution Guide.”