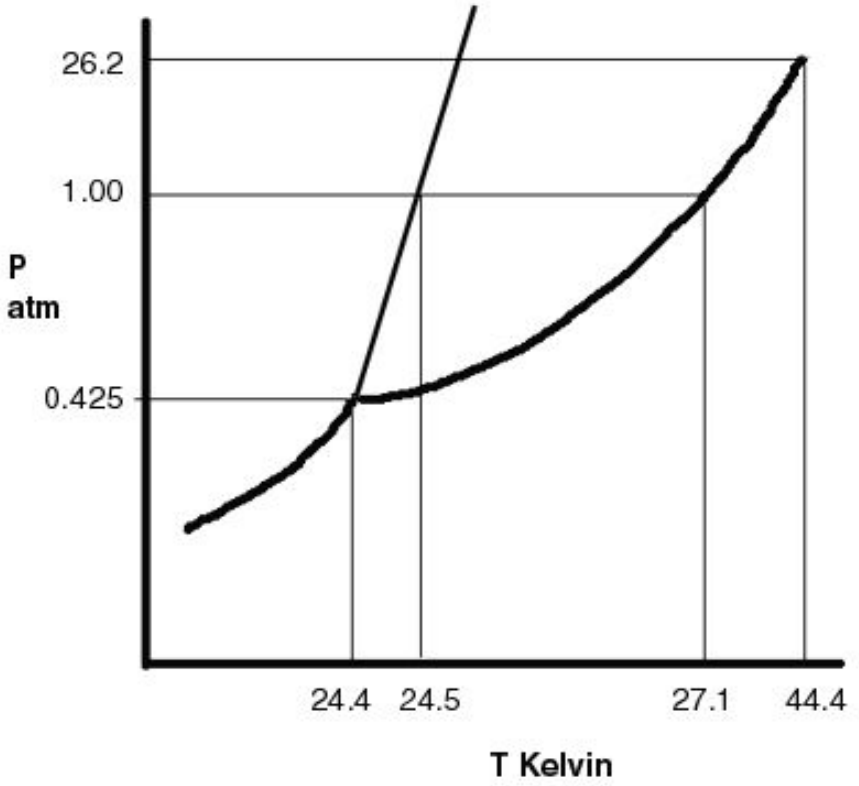
CHE 112 - Homework - Ch 10d

OER 10.4 **Phase Diagrams** Score: _____/40

Name: _____ Date: _____

[19 pt] 1. Properly label all of the following points on the phase diagram, and answer the questions below.

(a) Solid Phase
(b) Liquid Phase
(c) Gas Phase
(d) Supercritial Fluid
(e) Triple Point
(f) Critical Point
(g) Where Vaporization occurs
(h) Where Condensation occurs
(i) Where Melting occurs
(j) Where Freezing occurs
(k) Where Sublimation occurs
(l) Where Deposition occurs
(m) Normal Boiling Point
(n) Normal Melting Point
(o) Melting Curve
(p) Vaporization Curve
(q) Sublimation Curve



Questions:

(a) At what temperature will the substance melt?

(b) At what temperature will the substance boil?

(c) Is the Liquid or the Solid more dense? Explain.

[10 pt] 2. Krypton has a T_t = -169 ℃, P_t = 0.175 Atm, and T_c = -63 ℃, and P_c = 54 atm. The density of the liquid is 2.4 g/cm^3, and the density of the solid is 2.8 g/cm^3. Sketch a phase diagram and attach it to the homework. Label TP, CP, regions where Krypton is a gas, liquid, solid, x-axis, y-axis, and appropriate values on each axis.

Can a sample of gaseous Krypton at room temperature be liquefied by raising the pressure? Explain.

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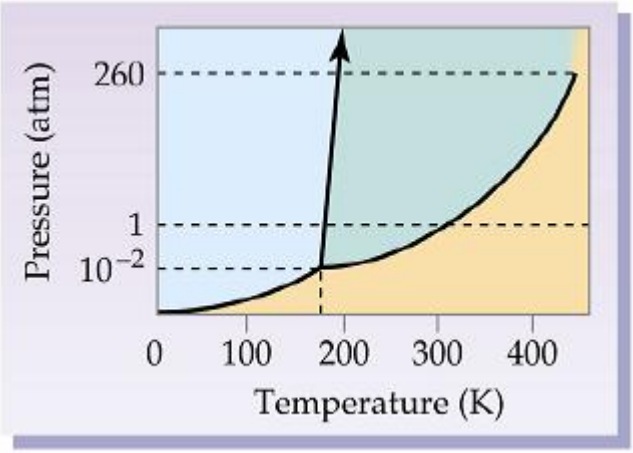
[5 pt] 3. Using the phase diagram below answer the following questions.



(a) What is the normal boiling point?

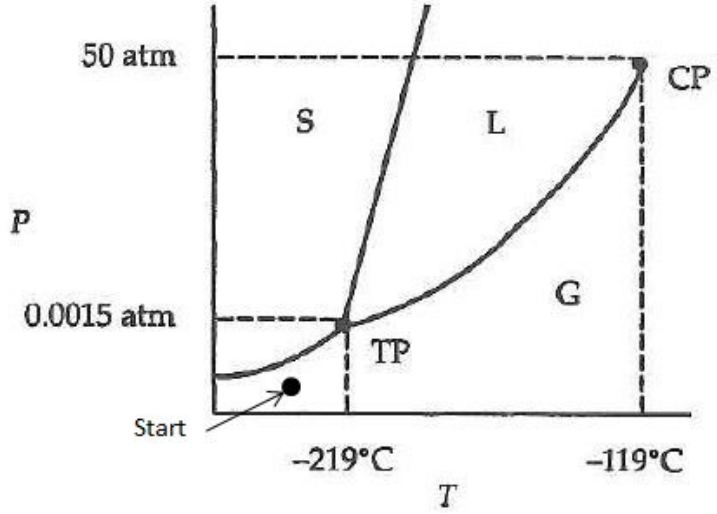
(b) What is the normal melting point?

What is the physical state when:
(c) T = 150 K, and P = 0.5 atm?

(d) T = 325 K, and P = 0.9 atm?

(e) T = 450 K, and P = 265 atm?

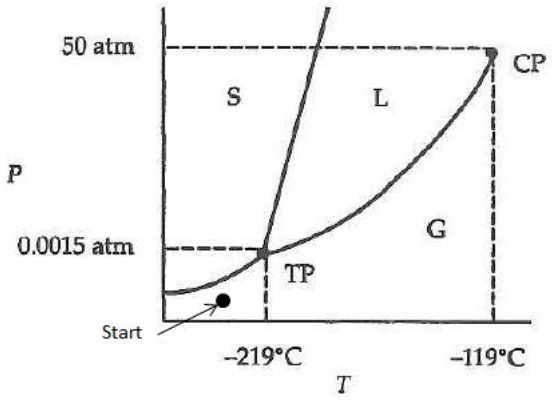
[2 pt] 4. Using the diagram below, what phases are present under the following conditions.



4(a) T = -210℃, P = 1.5 atm.

4(b) T = -100℃, P = 66 atm.

[4 pt] 5. Using the graph of oxygen below, draw the following path on the graph starting from 0.0011 atm and -225℃ (the point labeled start on the graph). For each step below indicate the phase transition that occurs.



5(a) Increase P to 35 atm, while keeping T constant.

5(b) Increase T to -150℃ while keeping P constant.

5(c) Decrease P to 1.0 atm, while keeping T constant.

5(d) Decrease T to -215℃ while keeping P constant.