

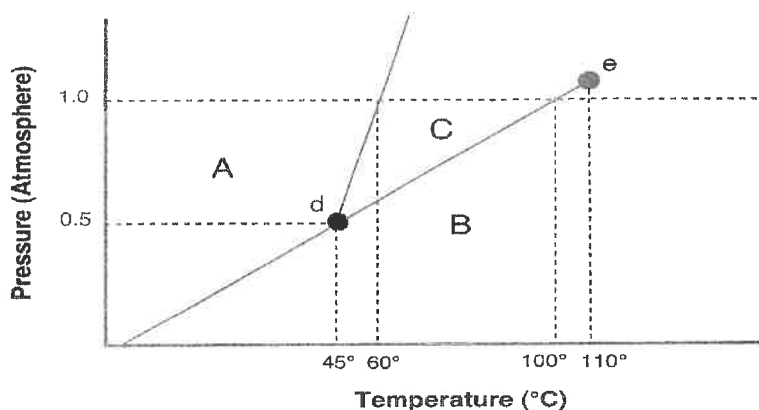
Phase Diagrams

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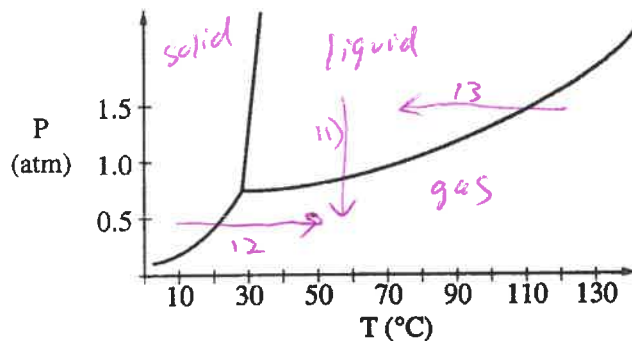
Answer the questions below in relation to the following phase diagram.



- Which section represents the solid phase? A
- What section represents the liquid phase? C
- What section represents the gas phase? B
- What letter represents the triple point? d In your own words, what is the definition of a triple point?
- What is this substance's melting point at 1 atmosphere of pressure? 60°
- What is this substance's boiling point at 1 atmosphere of pressure? 100°
- Above what temperature is it impossible to liquefy this substance, no matter what the pressure? 110°
- At what temperature and pressure do all three phases coexist? 0.5 atm, 45°
- At a constant temperature, what would you do to cause this substance to change from the liquid phase to the solid phase?
- What does sublimation mean? to go from a solid ^{raise pressure} directly to a gas.

For questions 11- 13, refer to the phase diagram below of a pure substance.

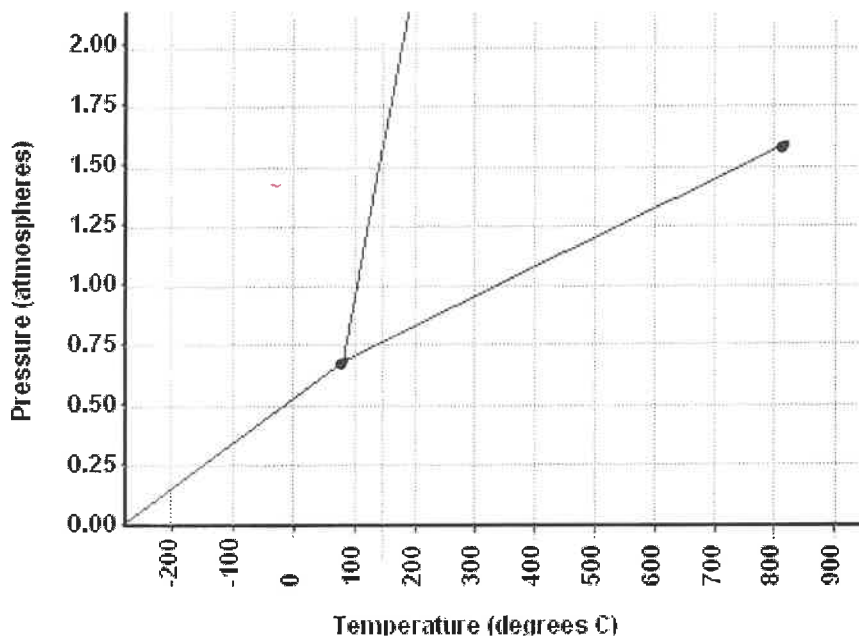
- (A) Sublimation
- (B) Condensation
- (C) Vaporization
- (D) Melting
- (E) Deposition



- If the pressure decreases from 1.5 to 0.5 atmospheres at a constant temperature of 50°C, which of the processes occurs? C
- If the temperature increases from 10°C to 50°C at a constant pressure of 0.5 atmospheres, which of the processes occurs? A
- If the temperature decreases from 110°C to 40°C at a constant pressure of 1.1 atmospheres, which of the processes occurs? B

Refer to the phase diagram below when answering the questions on the back of this worksheet:

NOTE: "Normal" refers to STP – Standard Temperature and Pressure.



- 14) What are the values for temperature and pressure at STP? T= 0°C, P= 1atm
- 15) What is the normal freezing point of this substance? 100°
- 16) What is the normal boiling point of this substance? ~330°
- 17) What is the normal melting point of this substance? 100°
- 18) If a quantity of this substance was at an initial pressure of 1.25 atm and a temperature of 300° C was lowered to a pressure of 0.25 atm, what phase transition(s) would occur? vaporization
- 19) If a quantity of this substance was at an initial pressure of 1.25 atm and a temperature of 0° C was lowered to a pressure of 0.25 atm, what phase transition(s) would occur? sublimation
- 20) If a quantity of this substance was at an initial pressure of 1.0 atm and a temperature of 200° C was lowered to a temperature of -200° C, what phase transition(s) would occur? freezing
- 21) If a quantity of this substance was at an initial pressure of 0.5 atm and a temperature of 200° C was lowered to a temperature of -200° C, what phase transition(s) would occur? deposition
- 22) If this substance was at a pressure of 2.0 atm, at what temperature would it **melt**? 175°
- 23) If this substance was at a pressure of 2.0 atm, at what temperature would it **boil**? It couldn't. above critical pt.
- 24) At what temperature do the gas and liquid phases become indistinguishable from each other? 820°
- 25) At what pressure would it be possible to find this substance in the gas, liquid, **and** solid phase? 80°C and 0.65 atm