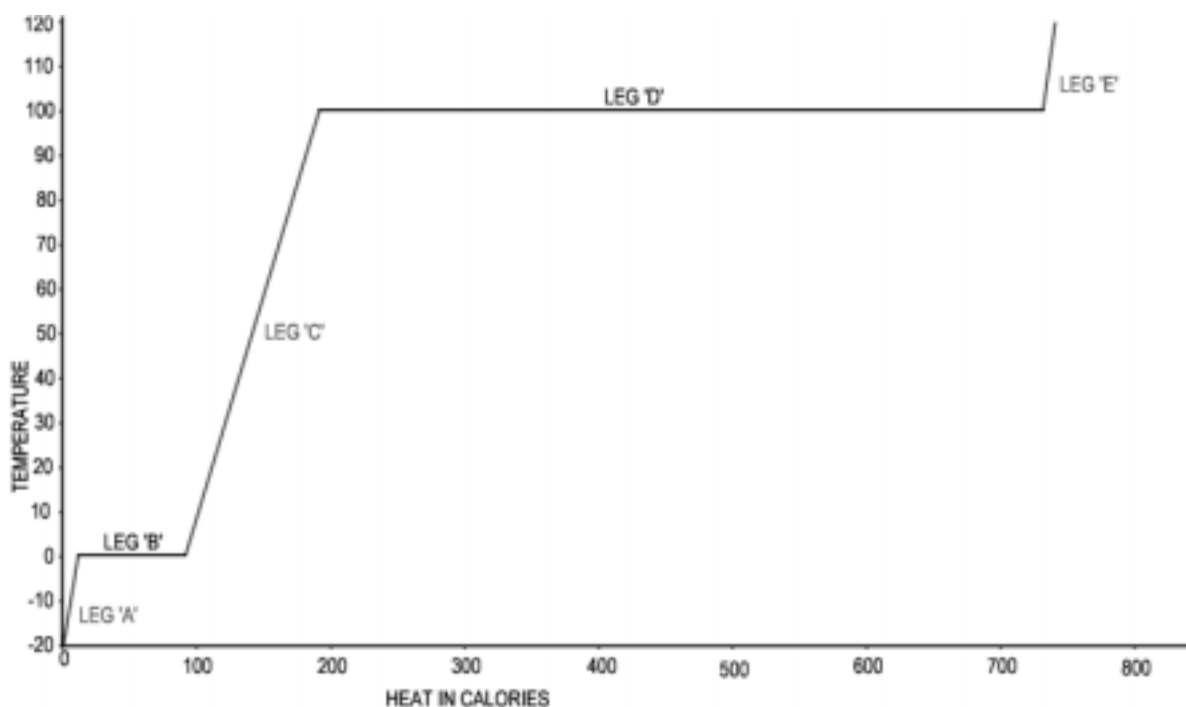


Change in Phase – Water

This diagram assumes the condition of 1 atmosphere pressure.



Leg "A": → Ice is heated from -20 °C to 0 °C
← Ice cools from 0 °C to -20 °C

Leg "B": → At 0 °C ice melts to form liquid water; temperature remains constant during a phase change; energy required is called heat of _____
← At 0 °C liquid water freezes to form ice; temperature remains constant during a phase change

Leg "C": → Liquid water is heated from 0 °C to 100 °C
← Liquid water cools from 100 °C to 0 °C

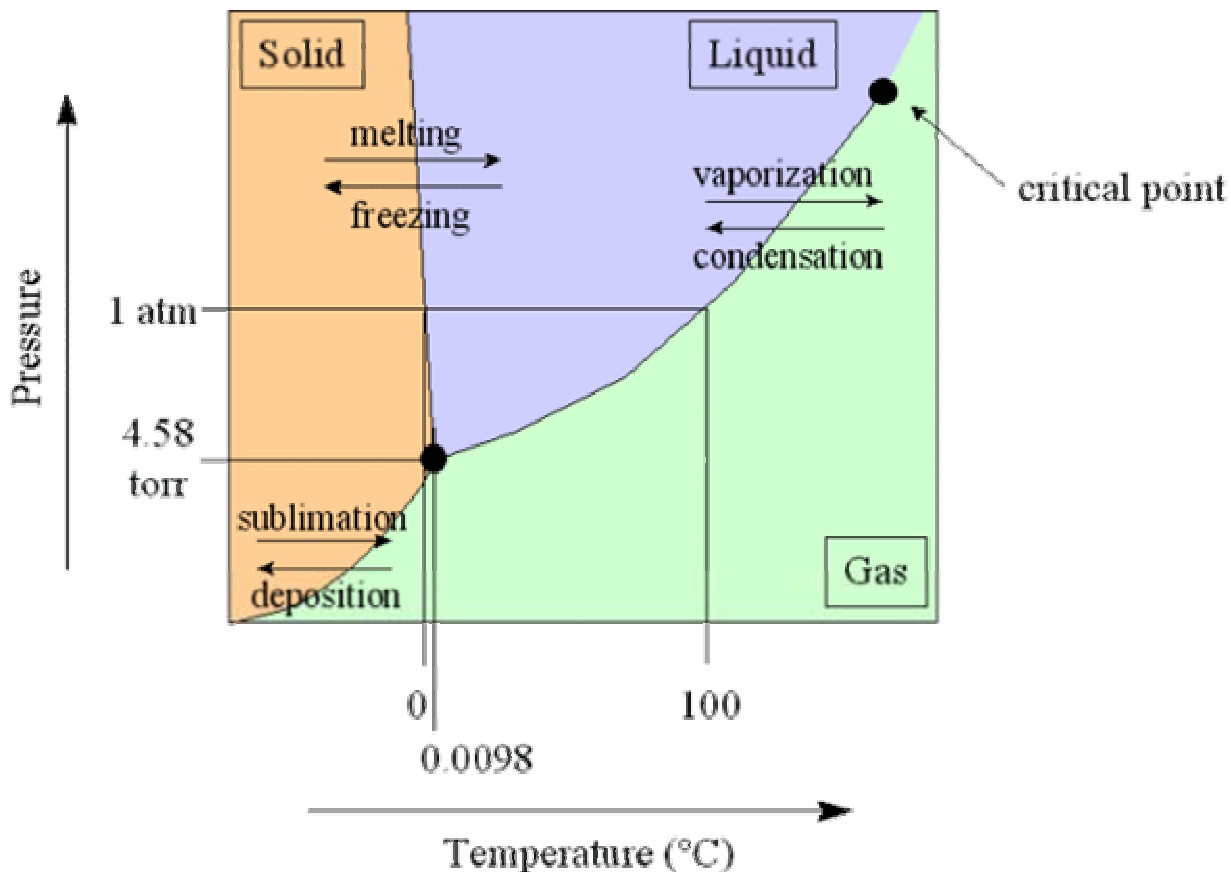
Leg "D": → At 100 °C water vaporizes to form water vapor; temperature remains constant during a phase change; energy required is called heat of _____
← At 100 °C water vapor condenses to form liquid water; temperature remains constant during a phase change

Leg "E": → Water vapor is heated from 100 °C
← Water vapor is cooled to 100 °C

Key Concepts:

1. Phase changes going from left to right (→) , including melting and vaporizing, require the absorption of energy (heat).
2. Phase changes going from right to left (←), including freezing and condensation, involve the removal of energy.
3. Temperature remains constant during a phase change.

Phase Diagram for Water



Definitions:

- _____ Phase change from solid to liquid
- _____ Phase change from liquid to solid
- _____ Phase change from liquid to gas
- _____ Phase change from gas to liquid
- _____ Phase change from solid to gas
- _____ Phase change from gas to solid
- _____ Point where all three phases exist at the same time in equilibrium (this is 4.58 torr and 0.0098 °C for water)
- _____ Temperature at which a substance melts at 1 atm pressure
- _____ Temperature (T_c) above which substances cannot exist as solids or liquids
- _____ Pressure (P_c) above which substances cannot exist as gases
- _____ Point identified by the T_c and P_c

Key Concepts:

1. Phase changes going from left to right (\rightarrow), including melting, vaporization, and sublimation, require the absorption of energy (heating).
2. Phase changes going from right to left (\leftarrow), including freezing, condensation and deposition, involve the removal of energy (cooling).