

Property Diagrams for Phase Change Processes

Variations of properties during phase change processes are best studied with the help of property diagrams.

T – v Diagrams

If a tank contains a water and if we increase the pressure above this water. This time phase change will start at a higher temperature, specific volume of sat. liquid getting larger and specific volume of saturated vapour is getting smaller. Also saturated mixture line is getting smaller too.

As the pressure on water is increased, the saturated mixture line will continue to get shorter and one day it will become only a point. This point is called a critical point. Above this point we cannot observe any significant phase change, specific volume of substance always increasing but we can only observe one phase (it's very similar with sublimation).

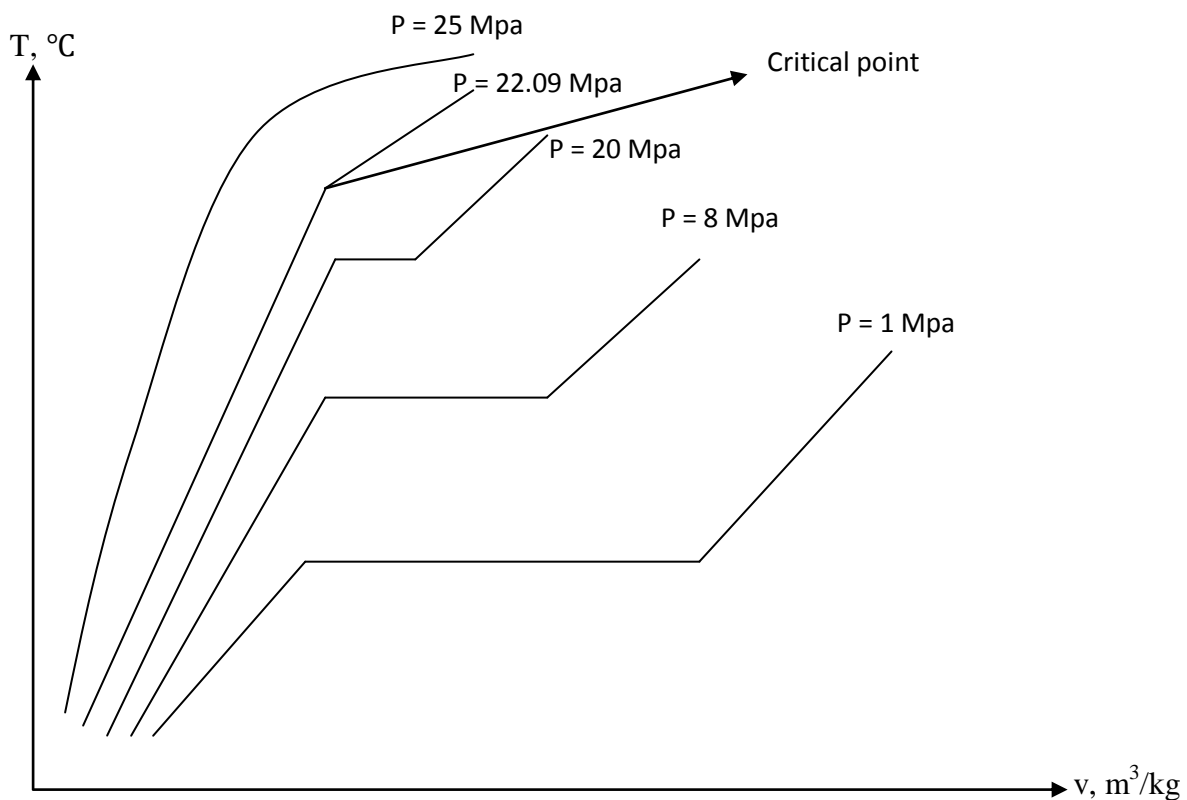
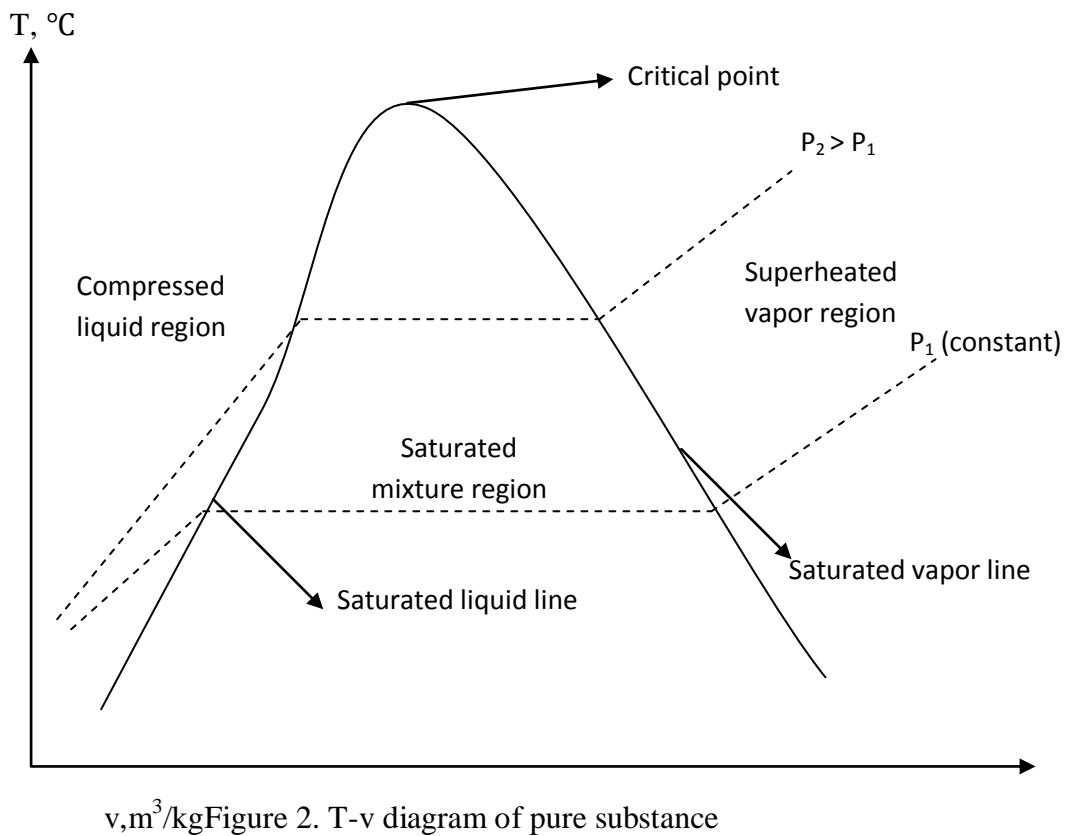


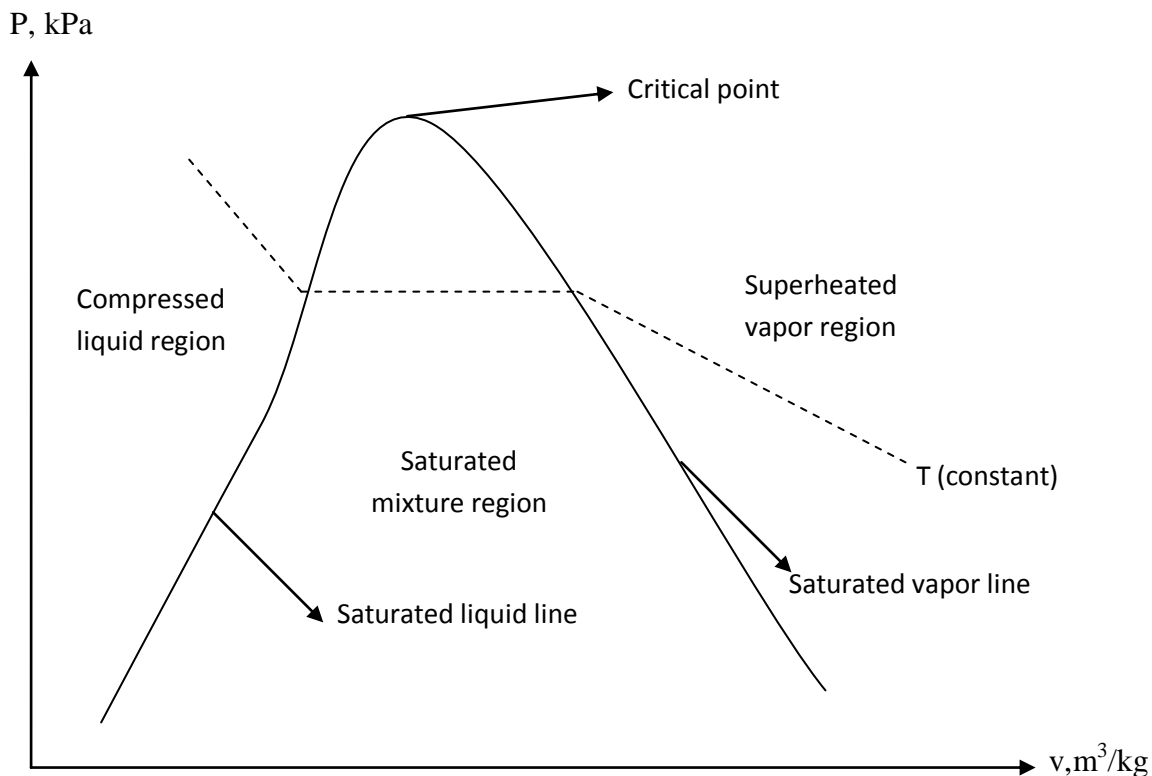
Figure 1. T –v diagram of phase change process of a pure substance at different pressure.



$v, m^3/kg$ Figure 2. T-v diagram of pure substance

P – v Diagrams

The general shape of P – v diagram of a pure substance is very similar with T – v diagram but temperature lines on this diagram have a downward trend.



P-T Diagram

The P-T diagram also called as a phase diagram.

In this diagram all phases seperated by solid lines..

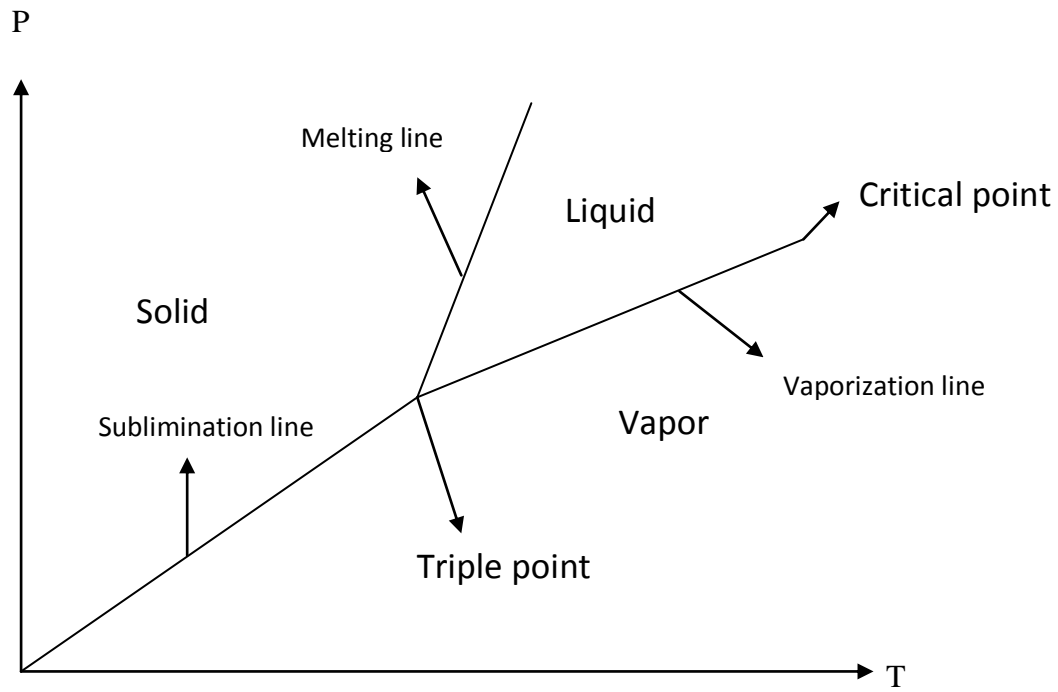


Figure 3. P – T diagram of pure substance.

