2. Draw the Phase diagram of water and also discuss the importance of various points, lines and areas.

The Phase diagram of water contains the following:

i) Curves OA, OB, OC and one meta stable curve OA'

ii) Areas COB, COA and AOB

iii) Triple point O

Curves:

Along the curve OA, water is in equilibrium with vapour.

Along the curve OB, ice is in equilibrium with vapour.

Along the curve OC, ice is in equilibrium with water.

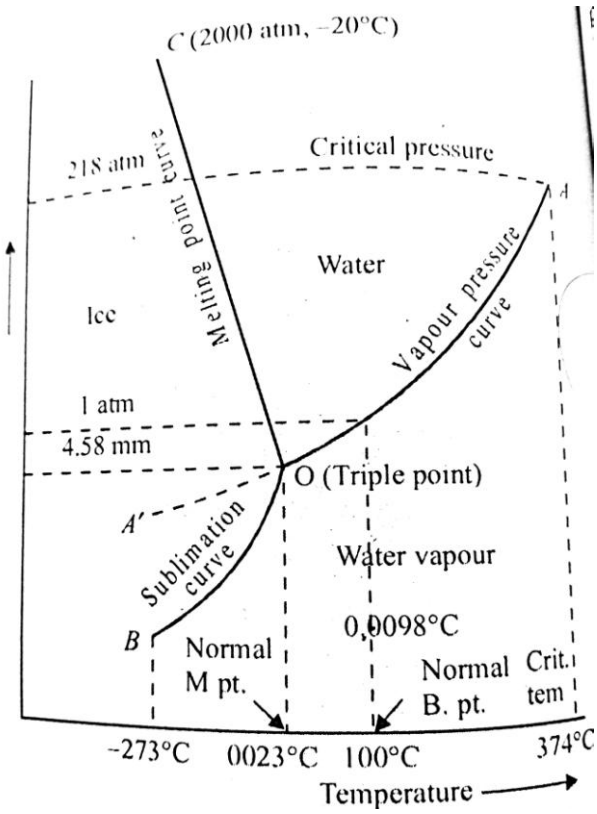
Applying phase rule, two phases are in equilibrium in the case of Curves.

F= C-P+2

= 1-2+2

= 1

The system is univariant.



Areas:

Inside the area COB, ice phase alone is present.

Inside the area CoA, water phase alone is present.

Inside the area AOB, Vapour phase alone is present.

Applying phase rule, only a single phase is present inside the Areas.

F= C-P+2

= 1-1+2

= 2

The system is bivariant.

Triple point:

It is the point where the three curves OA, OB and OC meet. At this point, all the three phases ice, water and vapour are in equilibrium.The point O is a self –defined point corresponding to definite temperature of 0.0098°C and a definite pressure of 4.58 mm. Applying phase Rule to triple point O,

F=C-P+2

= 1-3+2

= 0

The system is invariant.

Meta stable curve:

The dotted curve OA’, a continuation of curve OA represents curve of super cooled water. It is a metastable curve. On slight disturbance, the super-cooled phase at once changes to solid ice and merges into OB.