

One Component System

(2) Sulphur System ; -

Sulphur exists in two crystalline forms, rhombic and monoclinic with 95.6°C as the transition temperature at 1 atm pressure. Below 95.6°C \rightarrow rhombic is stable and above 95.6°C \rightarrow monoclinic is stable.

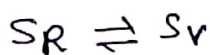
Sulphur exists in four possible phases, two solid (SR & SM) one liquid (SL) & one vapour (SV).

*. The Curve OA :-

It is the sublimation curve of rhombic sulphur, & gives

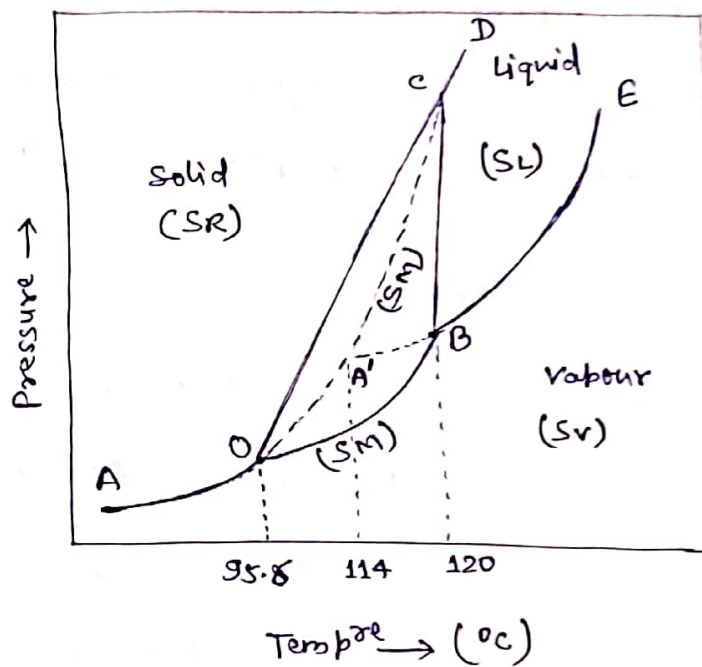
the vapour pressure of rhombic sulphur at different temperature.

The two phases are in equilibrium.



*. Point O

It is the transition temperature (95.6) at which rhombic sulphur changes into monoclinic sulphur. Point 'O' is the triple point at which three phases, (SR - SM - SV) co-exists in equilibrium.



* The Curve OB :-

It is the sublimation curve of monoclinic sulphur at different temperature.

* Point B :-

It is the melting point (120°C) of monoclinic sulphur. This is another triple point at which three phases (sm-SL-Sr) are in equilibrium.

* The Curve BE :-

It is the vapour pressure curve for liquid sulphur with temperature can be studied. The two phase exists in equilibrium. (SL ⇌ Sr).

* The Curve OC :-

It is the transition curve which gives the effect of pressure on the transition temperature of rhombic sulphur into monoclinic sulphur. The two phase exists in equilibrium. (SR ⇌ Sm).

* The Curve BC :-

The curve BC is the fusion curve for monoclinic sulphur. This gives the effect of pressure on the melting point of monoclinic sulphur. The two phase are in equilibrium. (Sm ⇌ SL).

* Metastable equilibria :-

The dotted lines in the Fig indicated as metastable equilibria. At first the solid, will exist in metastable equilibria with its vapour.

* Point A'

It represents the melting point of the metastable ~~or~~ rhombic Sulphur. This is another triple point where the three phases, $S_R - S_L - S_V$ co-exists in metastable equilibrium.

* The Curve A'C :-

It gives the effect of pressure on the melting point of metastable rhombic Sulphur. It is the fusion curve of metastable rhombic sulphur.

* Areas :-

The curve AO & OC both involves rhombic Sulphur in equilibrium with the vapour phase in one case and solid monoclinic sulphur in the other. The curves AO, OB & BC have the vapour phase as common.

The lines OC, OB and BC have monoclinic sulphur as the common phase.

—x—

from,

Dr. A.K. Gupta

Chemistry (L.S. College)