A presentation on "Vapour absorption refrigeration system"

- CONTENTS :
- Simple vapour absorption system(NH₃-H₂O)
- Practical Vapour Absorption System
- Lithium bromide absorption refrigeration system(Li-Br)
- Domestic Electrolux*(Ammonia Hydrogen) Refrigerator
- Comparison of refrigerant-liquid absorbent combination (NH₃-Water) with refrigerantsolid absorbent combination (NH₃-CaCL₃)
- Comparison of vapour absorption system and vapour compression system
- H-x chart

Simple vapour absorption system(NH₃-H₂O)



Practical Vapour Absorption



Lithium bromide absorption refrigeration system(Li-Br)



Domestic Electrolux*(Ammonia Hydrogen) Refrigerator



Fig. 7.5. Domestic electrolux type refrigerator.

Comparison of refrigerant-liquid absorbent combination (NH₃-Water) with refrigerant-solid absorbent combination (NH₃-CaCL₃) :

- The solid absorbent system has the following two main advantages :
- The amount of refrigerant cycled in relation to the amount of absorbent is larger for the solid absorbent then for the liquid absorbent. Therefore in solid absorbent system, the thermal capacity of the salt contributes little, and hence heat required in the generator is less as compared to that for water in the aqua-ammonia system.
- The solid absorbent system is extremely robust, not only in mechanical sense, but also with respect to adverse operating conditions. The performance is remarkably insensitive to changes in both condensing and evaporating temperatures. However the solid-absorbent, approximately twice the latent heat of vaporisation.
- However the C.O.P. for solid absorption cycle is still higher than that of liquid absorption cycle, particularly when the difference between the condensing temperature and the evaporating temperature is large.
- The solid-absorbent combination is ideally suited for

Comparison of vapour absorption system and vapour compression

S r No.	vapour absorption system	vapour compression system
1	It uses heat energy (low grade) to change the condition of the refrigerant from the evaporator.	It uses mechanical energy (high grade) to change the condition of the refrigerant from the evaporator.
2	The moving part of the system is a pump Thus, the operation of this system is essentially quiet and is subjected to. little wear.	The system with same capacity has more wear, tear, and noise due to moving parts of the compressor.
3	The load variations do not affect the performance of a system.	The performance is adversely affected on part loads.
4	The refrigerant leaving the evaporator has no bad effect on the system.	It is essential to superheat the refrigerant leaving the evaporator.
5	It has low C.O.P.	It has high C.O.P.
6	No. of components are more, thus it is bulky.	Less no. of components, thus it is less bulky.
7	Refrigerant charging is difficult.	Refrigerant charging is simple.



•Using h-c chart, several other processes involving energy transfer with binary vapour mixture can be readily be investigated.

Thank You!