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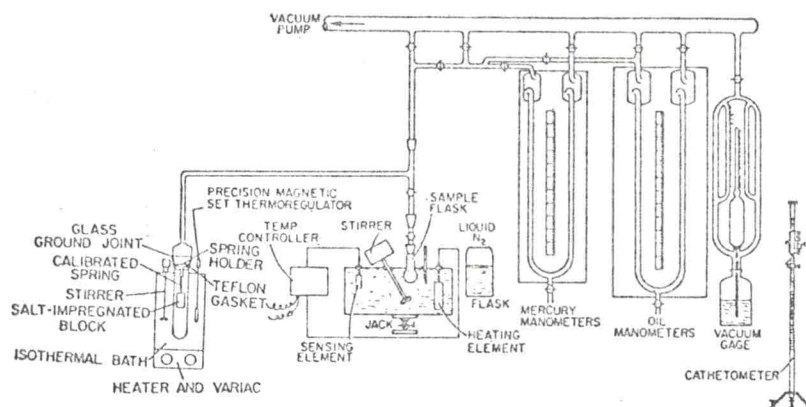


Figure 1. Static equilibrium apparatus

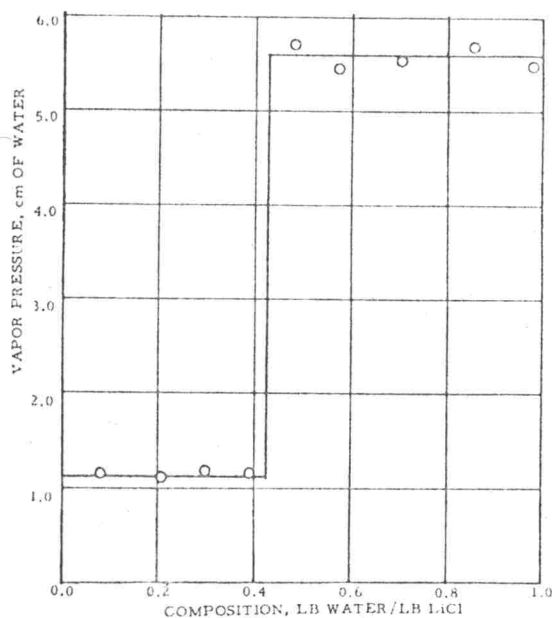


Figure 2. Vapor pressure-composition diagram for LiCl impregnated on Torvex

Temperature 32° C.
Salt impregnation 3.0 weight % LiCl
— Unsupported
○ Supported on Torvex

lithium chloride-water-Torvex system with that of an unsupported system—lithium chloride-water alone. Torvex does not change the vapor pressure.

Determination of Equilibrium Pressure of Unsupported Hygroscopic Salts. The sample flask is first dried in the oven, cooled, greased, and weighed accurately. About 2 to 5 grams of lithium chloride salt is introduced into the flask. Depending upon the region in which the vapor pressures are to be measured, an estimated amount of water is added to the salt with a syringe.

After the whole system, excluding the sample flask, is evacuated, the lithium chloride-water is deaerated by repeated heating and freezing of the sample, then connected to the manometer for measurements of vapor pressure. The readings are taken when steady state is reached.

The temperature of the bath is raised or lowered to the next desired level without further evacuation. After all the measurements are taken at various temperatures, the sample flask is taken out, cleaned, and weighed. The salt in the flask and the solution is titrated to find the mole fraction of lithium chloride.

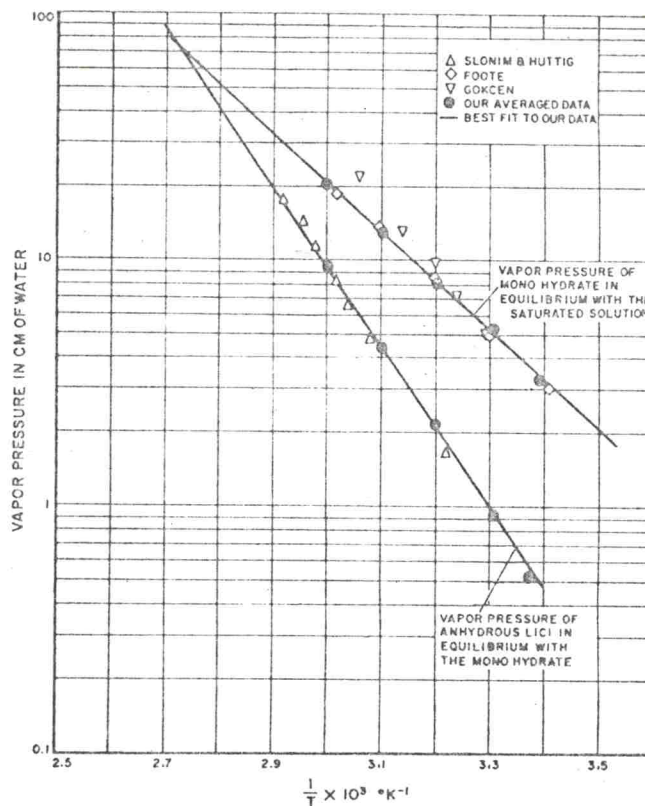


Figure 3. Vapor pressure-temperature diagram for LiCl-H₂O system

The variation of the vapor pressure with the temperature for the lithium chloride salt is shown in Figure 3. This figure shows the aqueous pressure of monohydrate in equilibrium with the anhydrous salt and with the saturated solution. These data lie on a straight line on a $\log P - 1/T$ plot in accordance with the familiar Clausius-Clapeyron equation.

Figure 3 compares the present data for the lithium chloride salt with the data available in the literature. The authors' data for the equilibrium between the anhydrous salt and monohydrate agree well with those of Slonim and Huttig (1929). Present data corresponding to the equilibrium between the monohydrate and the saturated solution show good agreement with those of Foote (1965). Many other investigators have also reported the vapor pressure data of saturated solutions. At high temperatures, Gokcen's data (1951), measured with a dynamic method, do not agree with the present data as well as with those of Foote. This is not