

We may do this by successive measurement of the vapor pressures of the solution at different concentrations. At each measurement we shall then introduce errors in reading the temperatures and pressures, in comparison with the temperature and pressure of the pure solvent. These errors will be compensated if we use a differential tensometer, in one limb of which we place the pure solvent, and in the other--the solution.

In our case we built up an isothermal and isobaric differential volumeter, giving a direct indication of the variation of volume of the gaseous solution during solution of the liquid in it.

The two vessels A and B, joined by a capillary filled with mercury, are immersed in a thermostat 3 (Fig. 1).

Fig. 1. I--trap; II--coil; III--float; IV--mercury level.

If both vessels are simultaneously full of gas at a definite pressure, the mercury in the capillary does not alter its position.

We disconnect the vessels, and add a measured amount of liquid to one of them (B) from the vessel L at constant temperature. Upon solution of the liquid in the compressed gas, the pressure in vessel B changes, and the mercury in the capillary is displaced. By gradual alteration of the volume of the volumeter V connected to vessel B, we may cancel out the fall in pressure which occurred in the system upon solution of the liquid in the gas.

Thus, in the above theoretical approach to solution of the problem, the matter has been reduced to accurate observation of displacement of a mercury level in a capillary, and to accurate measurement of the volumes of liquid in the volumeter.