On the height gauges of the dosimeter E and volumeter G we read the volume of liquid admitted to the system, and the change in volume of the system upon solution of this liquid into the compressed gas.

By plotting the movement of the dosimeter piston (volume of liquid admitted) against movement of the volumeter piston (change of volume of the system upon solution of the liquid), we obtain a graph. The slope of the curve relative to the x axis gives the value of the partial molar volume of the liquid in the compressed gas, in the homogeneous region.

Upon further supply of liquid there is a discontinuity in the curve. The point of discontinuity indicates saturation of the gas by the liquid.

Fig.6.

The slope of the curve after the discontinuity, upon further addition of liquid, gives the value of the partial molar volume of liquid in the heterogeneous region.

The general form of the curve obtained, for example for the nitrogen-benzene system (at 50 atm and 50 °C), is shown in Fig.6.

Conclusions:

1. An equipment has been built for measurement of the partial molar volumes of liquid dissolved in compressed gases.
2. The equipment permits data on partial molar volumes to be obtained in both the homogeneous and heterogeneous regions.
3. In addition to study of the volume relationships, the equipment allows data on phase equilibria to be obtained.
4. The equipment has been designed to operate at pressures from 1 to 5000 atm.