

temperature and pressure of the experiment⁸ divided by the volume of the vessel. This description lacks physical reality in systems with volume changes of mixing, but will be made use of, since the critical conditions in lattice theories are described in terms of volume fractions. With solvents other than propane where only the critical loci, and not the isotherms, were determined, there was no need for accurate determinations of the weight or volume fractions.

RESULTS

Phase Behavior of Polyethylene-*n*-Propane

Perhaps the most characteristic feature of the system polyethylene-*n*-propane at 110°C. is the existence of a pressure, above which a single phase exists, and which is an only slowly varying function of composition at low polymer concentrations. This pressure is a dew-point or bubble-point pressure and may be represented by means of an isotherm, i.e., by a (pressure-composition) section of the three-dimensional model (Fig. 3).

The maximum pressure on the isotherm which also corresponds to incipient separation of two phases of equal composition is an upper critical solution pressure (UCSP). Since the curve is nearly flat near the UCSP, this pressure is easily determined, whereas the corresponding critical poly-

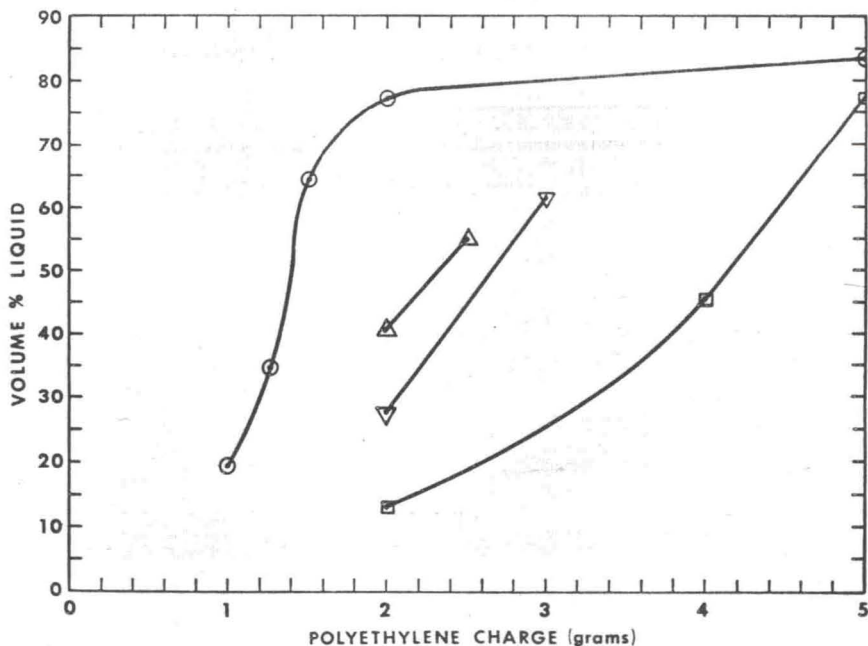


Fig. 3. Phase volumes at phase separation as a function of polymer charge for polyethylene-*n*-propane at 110°C.: (○) fraction 2; (△) fraction 3; (▽) fraction 4; (□) fraction 5.