concentration is not. The experimental error in the dew-point and ble-point pressures is such that the maximum cannot be located along composition axis by inspection. Instead, the weight fraction W_c' olume fraction ϕ'_c of polymer at which the system breaks up into two ses of equal volumes can be located approximately from a plot of phase ime just below the isotherm as a function of composition (Fig. 3). convenience, this is termed the apparent critical composition. The e critical concentration cannot be very far from the apparent critical centration for two reasons: relative phase volumes change rapidly h composition (Fig. 3) and only extreme dissymmetry in the pressure-iposition diagram close to the critical point could lead to a wide diver-ce between the two points. Also, although no attempt was made to ne exactly the concentration range in which critical scattering occurred, solutions which were darkest in color by transmitted light generally urred at concentrations such that the lower phase occupied 30–50% of volume. It seems legitimate to conclude that whereas W_c might sibly be as much as 30% lower than W'_c, it cannot greatly exceed the ues of W'_c listed because of the noticeable drop in pressure on the iso-rm (pressure–composition section) at concentrations greater than W'_c.

able I presents the critical pressures and apparent critical compositions four fractions of molecular weight 17,000–250,000 at 110°C. The ical points are seen to occur at low polymer concentrations, a situation ical for polymer–solvent systems. The critical pressures converge for high fractions, suggesting the existence of a limiting value for polymer infinite molecular weight. According to the Flory-Huggins theory,[9] critical concentrations are given approximately by $x^{-1/2}$, where x is ratio of molecular volumes of polymer and solvent. The apparent ical concentrations are seen to exceed $x^{-1/2}$, but the dependence is ap-ximately of the form required.

he existence of a second, and higher, critical pressure at which the system in breaks up into two phases is conceivable. This, according to ndard terminology, would be a lower critical solution pressure. No h phenomenon was encountered with the highest molecular weight tion at pressures up to 2,000 atm. at 130–150°C.

TABLE I
er Critical Solution Pressures and Critical Polymer Concentrations for Fractions of Polyethylene in Propane at 110°C.

signation of fraction	Molecular weight of fraction	Critical pressure, atm.	Apparent critical concentration of polymer		
			Wt. fraction	Vol. fraction	$x^{-1/2}$
2	246,000	582	0.042	0.027	0.017
3	89,000	561	0.072	0.045	0.028
4	37,000	531	0.082	0.054	0.044
5	17,000	449	0.129	0.090	0.066