transition occurs below 2.7 km/sec because the lower line extrapolates to a value on the U_s axis which is higher by 44% than the measured sound velocity*. Bridgman[11] did find that liquid benzene freezes at 0.67 kbar and 25°C and this may account for the poor agreement between the measured sound speed and the extrapolated value.

Fig. 16 is a plot of the data in the pressure-relative volume (P-V/V_0) plane. There is considerable scatter of the points, clouding the actual appearance of the curves. The Hugoniot is drawn as two curves representative of two different phases. The few points between these two phases is shown as fitting a convex upward curve. Both the U_s-U_p plot and the P-V/V_0 plot indicate the transition starts at 125 kbar and ends at 180 kbar. If the upper Hugoniot curve is extrapolated to 125 kbar pressure and the lower curve is used as a reference, the change in V/V_0 due to the transition is about 10%. This large value might be expected from a first order phase change. The two curves were determined from a least squares fit to a third order polynomial with three coefficients. For the upper curve, the equation is

$$P = -103V/V_0 + 155(V/V_0)^2 + 52(V/V_0)^3$$

and for the lower one

$$P = -8V/V_0 + 210(V/V_0)^2 - 6(V/V_0)^3.$$

* Richard Ford of this laboratory measured the sound speeds of benzene, carbon disulfide, and carbon tetrachloride at 22°C and local atmospheric pressure and found them to be 1.31, 1.16, and 0.93 km/sec respectively.