measured shock velocity then reflects this overdrive pressure and as a result there is a region in the U_s-U_p plane where the shock velocity increases slowly. When the material transforms and the pressure relaxes, the shock wave becomes unstable and two shocks form. This explanation seems to generally fit the benzene data. The best answer may be provided by combining the concepts of a metastable Hugoniot and a pressure dependent transition with the idea that a transition region is represented by a convex upward curve in the P-V plane.

The following is an attempt to classify[28, 37] and to provide a plausible explanation for the transition observed in benzene. It is proposed that a first order phase transition has occurred in benzene. It is also proposed that the slope of the pressure-temperature (P-T) phase line is positive as Fig. 17 illustrates. The diagrams apply only to high pressure and temperature phases and do not include any freezing lines. In addition, this picture does not provide any details about the mechanism of the transition.

Freezing to a form of ice of benzene seems unsatisfactory even though the liquid may be in a supercooled condition, because the shock process does not provide enough time for the benzene molecules to arrange themselves in a specific ice structure. Furthermore, compression hinders rotation of the molecules to a specific orientation. The temperature associated with the start of the transition at 125 kbar was calculated to be $2200^\circ K$ by the computer code described previously. Under these particular conditions of temperature and pressure, the molecular bonds are probably distorted and redistributed to such an extent that a more compact form of benzene is initiated. At 180 kbar, the transformation is complete and the Hugoniot now has the charac-