straight line, a short section from 5.7 to 6.2 km/sec over which the shock velocity increases slowly, and a third region from 6.2 to 9.0 km/sec where the data fits a second straight line. There is very good agreement of the present work with the limited data of Walsh and Rice (reference 14) but the data of Cook and Rogers (reference 16) show a higher particle velocity for a given shock velocity. However, the line through their points parallels the line through the present data. The experimental technique [36] employed by Cook and Rogers was dependent upon direct measurement of the free surface velocity of the liquid by optical methods and invoked the free surface approximation to get the particle velocity. The poor agreement may be due to a condition existing in the liquid similar to spalling in a solid which invalidates the approximation. That is, the compressed liquid separates into very thin layers or a vapor as the shock wave reflects from the free surface and would enhance the free surface velocity.

A linear least squares fit of the U_s-U_p data yields for the lower region

$$U_s = 1.88 \pm 0.05 + 1.58 \pm 0.03 U_p.$$

From 6.2 to 9.0 km/sec, the data is fit by

$$U_s = 1.68 \pm 0.12 + 1.34 \pm 0.03 U_p.$$

The middle region was fitted to the following equation,

$$U_s = 4.77 \pm 0.29 + 0.43 \pm 0.09 U_p.$$

The data of references 14 and 16 were not included in the fit.

From the appearance of the the U_s-U_p plot, it is obvious that the benzene undergoes some type of transition beginning at a shock velocity of 5.7 km/sec. There is also the possibility a second