Dremin and Karpukhin is being used.[14] Lucite, which has a well-known Hugoniot, is mixed with CdS powder and formed into sample specimens. Shock experiments on the mixture then yield pressure-density data which can be reduced to give corresponding values of pressure and density in the CdS. These data then allow for calculation of both shock and particle velocities in the CdS and hence the determination of its Hugoniot.

Two preliminary shots, one using a quartz gauge and one using a manganin gauge, have been fired. These data tentatively suggest a phase transformation between 25 and 28 kbar.

B. Lithium Fluoride (LiF)

Eight experiments have been performed with lithium fluoride single crystals oriented in the (100) direction. Of these, three corresponded to driving stresses in the 11-14 kbar range and five represented driving stresses of about 25 kbars. In all of the shots quartz gauges were used to determine stress states in the samples. The objective of this series of shots was to study the behavior of the elastic precursor decay in comparison to existing theoretical predictions of decay for a stress relaxing solid (for example, see references 17-19). Lithium fluoride is an ideal material to study in this respect since an abundant amount of work relating yielding mechanisms to mechanical properties[20] has previously been performed on it by other investigators.

The crystals studied were purchased from Semi-Elements, Inc. as optical quality LiF. The purity of the material was about 99.99% LiF and the mosaic spread within subgrains was less than 2^{o}. Since the dislocation density is important to theoretical predictions of precursor decay, it was measured for most of the crystals that were shot. The nominal overall dislocation density was about 2×10^{6} for each sample, although in some of the samples there were areas which exhibited major fluctuations from this value. Also, it was found that the static yield strength in uni-axial compression ranged from about 0.15 kbars to 0.3 kbars.