

In order to measure the compressibility then, we measure the line shift observed between exposures at different pressures. By superimposing exposures at different pressures on the same film, errors due to changes in sample-to-film distance, or film shrinkage, etc. are avoided. The line displacement which is proportional to the compressibility is easily estimated visually to one twentieth of a millimeter. Attempts have been made to resolve the shifted lines with a densitometer in order to achieve even greater precision. However, at convenient exposure levels this could not be done.

Extrusion of the sample from between the faces of the diamond anvils results in a loss in intensity of the diffraction rings and, if extensive, in a reduction in pressure under the anvils by filling the space around the anvils, and absorbing some of the load. Powder samples have been prepared in several ways to avoid this difficulty. The best samples have been prepared by prepressing at about 1000 psi either dry powders or powders which have been infiltrated with parlodion.

Before pressing, a copper specimen support 2 1/2 mm in diameter with a 0.8 mm central hole is placed on the powder. During pressing the powder is forced into this hole. The excess powder is trimmed away and the sample is mounted between the diamond anvils. This copper ring gives lateral support to the sample.

Typical photographs are shown in Figures 7 and 8. The sample material is rubidium chloride. The first figure shows two exposures at ~25 kilobars and at 1 atm. Lines are observed of both the high pressure form with the cesium chloride structure and the low pressure form with the rock salt structure. Also visible are Laue' spots from the two diamond crystals.