

Fig. 6 -- Stress-particle velocity (σ - u) plot of BaF_2 as obtained from the front surface impact experiments. The line marked $\langle 111 \rangle$ denotes the estimated σ - u dependence of β - BaF_2 in $\langle 111 \rangle$ direction. It is identical with σ - u plot for $\langle 100 \rangle$ direction. ● steady state stress realized in the experiments. x the pair of σ , u values corresponding to minima in the experiments. ■ the steady state (σ , u) values for $\langle 100 \rangle$ shots.

as obtained from the elastic constant data of BaF_2 .²¹ In the same vein, if we plot the magnitude of the stress corresponding to minima and related particle velocity, these two sets of data form a cusp at 22 to 24 kbars.

The stress profiles obtained for BaF_2 specimens oriented along the $\langle 100 \rangle$ direction show that a steady state stress is reached immediately. A plot of stress and particle velocity indicates that these pairs of points lie along the curve of elastic compression of the β -phase of BaF_2 . A stress profile obtained around 40 kbars for the $\langle 100 \rangle$ orientation is shown in Fig. 7.

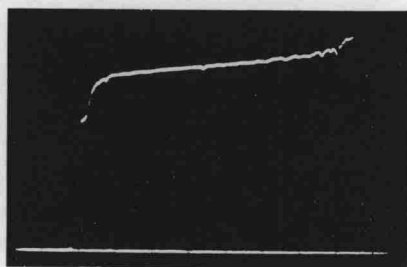


Fig. 7 -- Stress-time profile obtained for shock compression of BaF_2 in $\langle 100 \rangle$ direction with an impact stress of 40 kbars.

Transmission Experiments

Only three transmission experiments have been performed. A representative stress profile recorded by a quartz gage at 38 kbars is shown in Fig. 8. Stress profiles obtained around 20 kbar show the same character as that shown in Fig. 5. The nature of the profile obtained at higher stresses makes it difficult to analyze in a straightforward manner, and no further transmission experiments have been performed as of this date.

Recovery Experiments

Two recovery shots were performed. The details of design and construction, being of only ancillary interest, are not described here. Both experiments were performed at 35 to 40 kbars, well above the stress at which the minimum occurs in the stress profile.

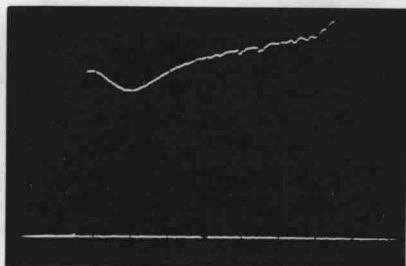


Fig. 8 -- Transmitted stress-time profile for BaF_2 in $\langle 111 \rangle$ direction with an impact stress of 40 kbars.