

FIG. 3. Effect of pressure on the spectra of the *F* band in KCl.

side of the *F* band under pressure. They made an extensive investigation of its characteristics which can be summarized as follows:

- (1) The *K'* band grows with increasing pressure at the expense of the *F* band.
- (2) Transition between the two bands is reversible.
- (3) Bleaching with light of the frequency of one band bleaches both bands.

As a result of the further measurements presented in this paper the following additional observations can be made:

(a) Measurements on three alkali halides which do not undergo phase transition at any known pressure or temperature, NaCl, NaBr, and LiCl, failed to produce

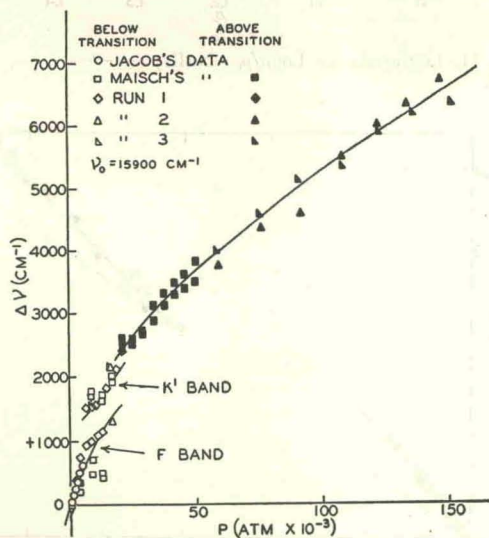


FIG. 4. Effect of pressure on the spectra of the *F* and *K'* bands in KBr.

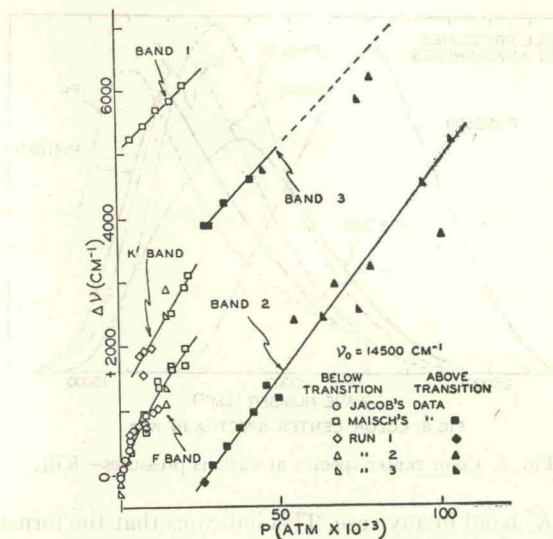


FIG. 5. Effect of pressure on the spectra of color centers in KI.

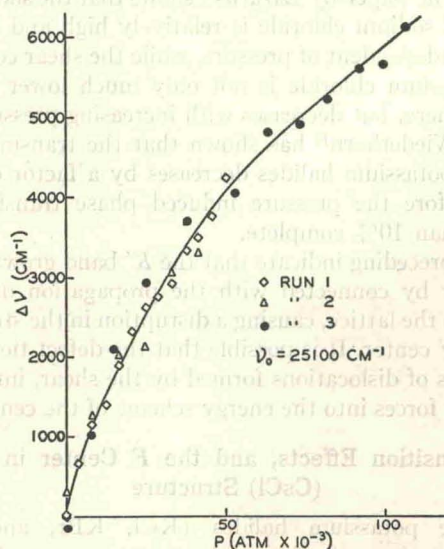


FIG. 6. Effect of pressure on the spectra of the *F* band in LiCl.

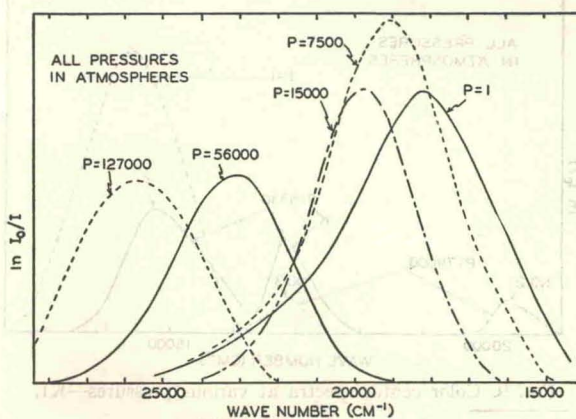


FIG. 7. *F* center spectra at various pressures—KCl.

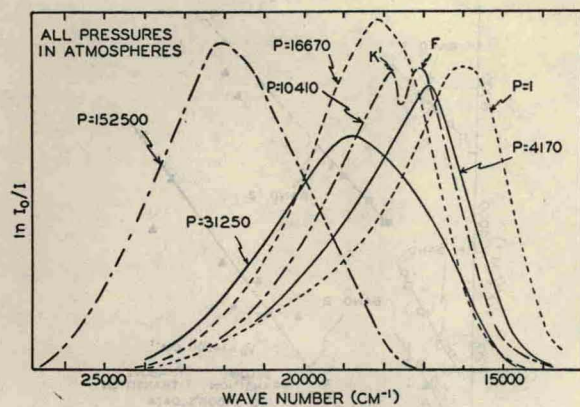


FIG. 8. COLOR CENTER SPECTRA IN KBr

FIG. 8. Color center spectra at various pressures—KBr.

the  $K'$  band in any case. This indicates that the formation of the  $K'$  band is related in some way to the transition between the two alkali halide structures.

(b) The paper by Lazarus<sup>11</sup> shows that the shear constant of sodium chloride is relatively high and is relatively independent of pressure, while the shear constant of potassium chloride is not only much lower at one atmosphere, but decreases with increasing pressure.

(c) Wiederhorn<sup>12</sup> has shown that the transmittance of the potassium halides decreases by a factor of over  $10^{-3}$  before the pressure induced phase transition is more than 10% complete.

The preceding indicate that the  $K'$  band growth may possibly be connected with the propagation of shear through the lattice, causing a disruption in the structure of the  $F$  center. It is possible that the defect ties down the ends of dislocations formed by the shear, introducing new forces into the energy scheme of the center.

### C. Transition Effects, and the $F$ Center in the sc (CsCl) Structure

Three potassium halides (KCl, KBr, and KI) transform from the fcc to the sc structure at 19 000–

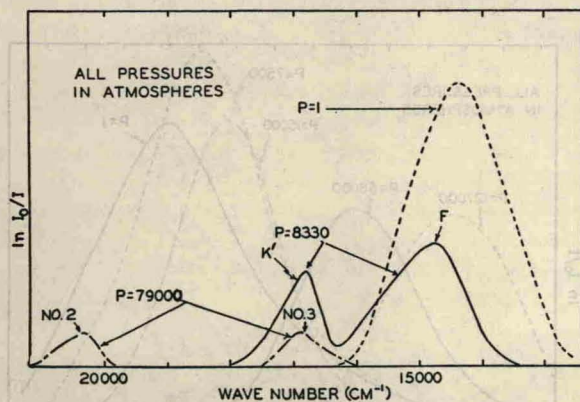
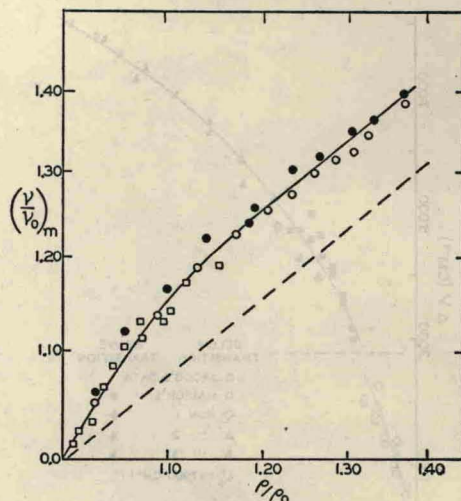
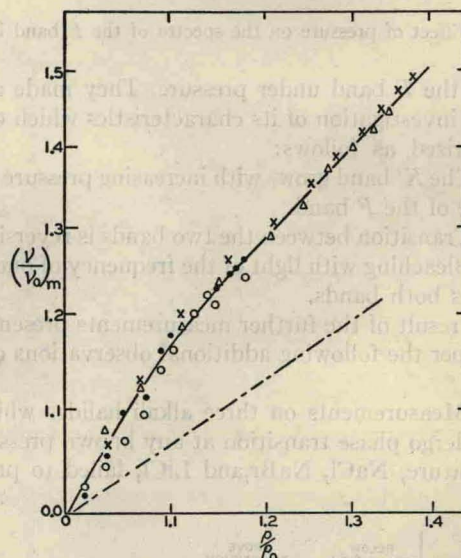
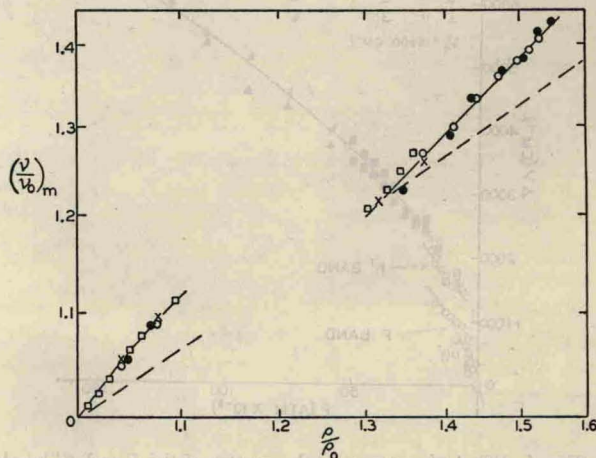


FIG. 9. Color center spectra at various pressures—KI.

<sup>11</sup> D. Lazarus, Phys. Rev. **76**, 545 (1949).

<sup>12</sup> S. Wiederhorn (private communication).

FIG. 10.  $\text{Log}(v/v_0)_m$  vs  $\text{log} \rho/\rho_0$ —NaCl; — — —,  $v/v_0 \sim (\rho/\rho_0)^{2/3}$ .FIG. 11.  $\text{Log}(v/v_0)_m$  vs  $\text{Log} \rho/\rho_0$ —NaBr; — — —,  $v/v_0 \sim (\rho/\rho_0)^{2/3}$ .FIG. 12.  $\text{Log}(v/v_0)_m$  vs  $\text{log} \rho/\rho_0$ —KCl; — — —,  $v/v_0 \sim (\rho/\rho_0)^{2/3}$ .