They were n-type with a specific resistivity of 0·08Ω-cm. The results are shown in Fig. 2. The initial energy gap is about 1·4 eV at $\alpha = 30$ cm^{-1}. The absorption edge shifts blue with

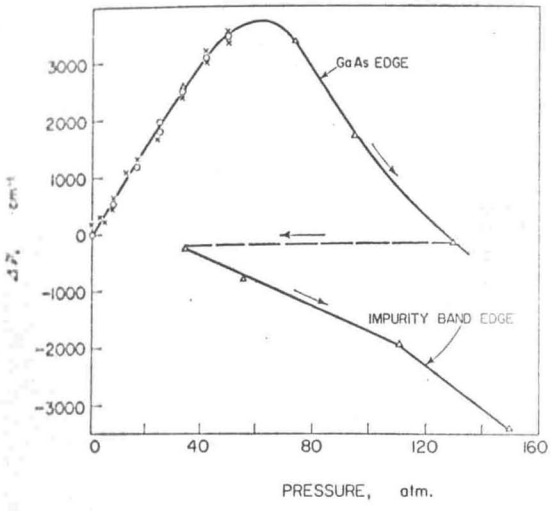

FIG. 2. Shift of gallium arsenide absorption edge with pressure ($\nu_0 = 11{,}850$ cm^{-1}, $\alpha = 50$ cm^{-1}).

pressure, the initial slope being 9·4 (10^{-6}) eV/atm, rising to a maximum shift of 0·465 eV at 60,000 atm. The red shift above 60,000 atm has a slope of roughly −8·7 (10^{-6}) eV/atm, and may be due

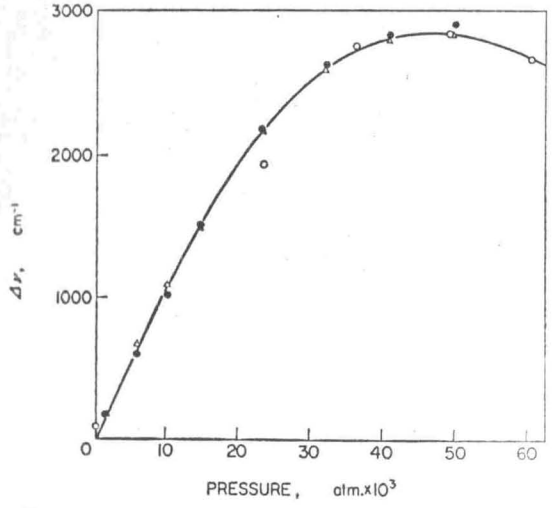

FIG. 3. Shift of gallium antimonide absorption edge with pressure ($\nu_0 = 5620$ cm^{-1}, $\alpha \simeq 20$ cm^{-1}).

in part to the indirect (100) transition, and in part be due to the irreversible effects discussed below.

(c) *Gallium antimonide*

The GaSb was obtained from Dr. J. H. WHELAN, of the Bell Telephone Laboratories. It was of unknown but high purity. The results are shown in Fig. 3. The initial transition has an energy gap of 0·7 eV at $\alpha = 20$ cm^{-1}, compared to 1·5 eV for GaAs and 2·4 eV for GaP. The initial blue shift of GaSb has a slope of 12·3 (10^{-6}) eV/atm. indicating a more rapid rise of the conduction-band minimum than in GaAs. The maximum apparent shift of 0·35 eV occurs at about 50,000 atm, after which the red shift, probably corresponding to the indirect (100) transition, begins.

2. GROUP IIB–VIB COMPOUNDS

(a) *Zinc blende type*

(i) *Zinc sulfide.* Pure zinc sulfide single crystals in the zinc blende structure were obtained from L. W. STROCK, of Sylvania Electric Products Inc. The initial optical energy gap was found to be 3·5 eV, and is considered to be the transition at $\boldsymbol{k} = 0$, as is indicated by a band-structure calculation being carried out by SHAKIN and BIRMAN[4]. The shift with pressure, shown in Fig. 4,

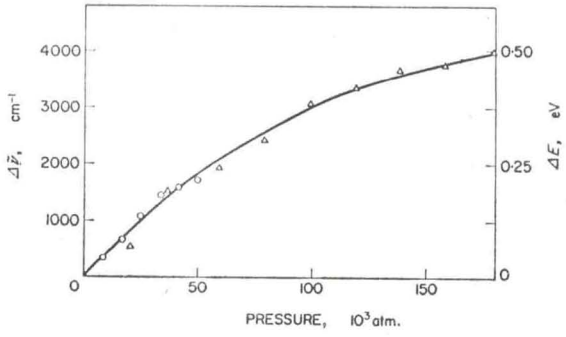

FIG. 4. Shift of zinc sulfide absorption edge with pressure ($\alpha = 60$ cm^{-1} measured from $\tilde{\nu}_0 = 28{,}600$ cm^{-1}).

consists of a monotonic blue shift, appearing to approach a maximum of about 0·50 eV at the highest pressure obtained, 180,000 atm. The initial slope of 5·7 (10^{-6}) eV/atm compares with 9(10^{-6}) eV/atm obtained by PIPER *et al.*[5] for hexagonal ZnS (wurtzite) up to 1700 atm. One