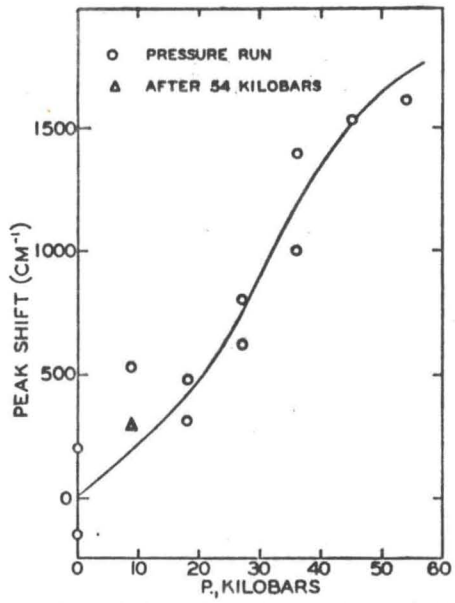

FIG. 12. Shift of dimer absorption peak at 21,700 cm^{-1} vs pressure—acridine yellow in boric acid—1.8×10^{-4} g/g.

T_1 states with pressure would more than account for the decrease in decay times. However, there is a large portion of alpha decay, probably about 30 to 40% (estimated from emission spectra) so the change in the decay time cannot be entirely described in terms of beta decay.

II. EFFECT OF PRESSURE ON ACRIDINE YELLOW AND ACRIDINE ORANGE PHOSPHORS DISSOLVED IN BORIC ACID

Acridine yellow and acridine orange are discussed together because they have similar structural formulas and behave qualitatively the same under pressure.

Typical absorption spectra vs pressure are shown in Figs. 8 and 9. They both show two major peaks with a shoulder on the red side of the blue peak. Other workers

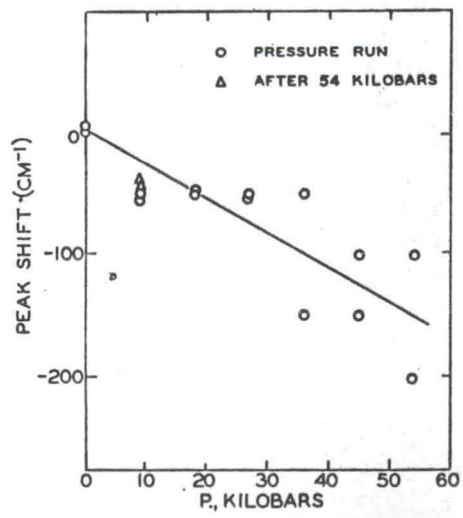

FIG. 13. Shift of dimer absorption peak at 20325 cm^{-1} vs pressure—acridine orange in boric acid—5.4×10^{-4} g/g.

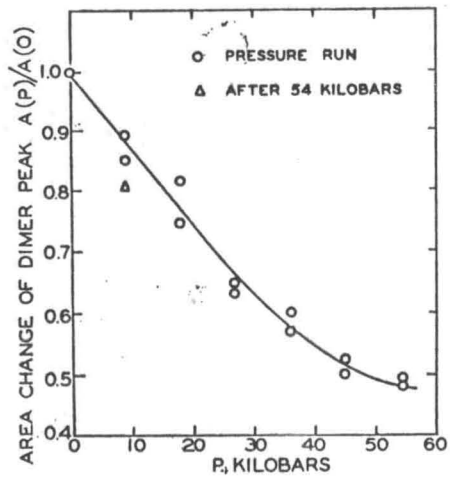

FIG. 14. Area change of dimer absorption peak vs pressure—acridine yellow in boric acid—1.8×10^{-4} g/g.

have found the red peak to be concentration dependent,[14] the higher the concentration, the larger the red peak relative to the blue peak. This peak has been associated with the formation of a dimer, and the blue peak is associated with the monomer. As pressure is applied the dimer peak decreases in intensity, and so does the shoulder on the monomer peak. One would thus associate the shoulder with absorption in the dimer, perhaps the transition corresponding to the monomer peak, only shifted slightly red.

Figures 10–15 show for both compounds the shift in monomer and dimer peak maxima with pressure, and the change in area of their respective dimer absorption peaks with pressure. For both compounds the monomer absorption peak shifts red with pressure. But, their dimer absorption peak maxima shift in opposite directions. The dimer peak for acridine yellow shows a large blue shift, and that for acridine orange shows a small red shift. However, the red edge of the dimer peak shows

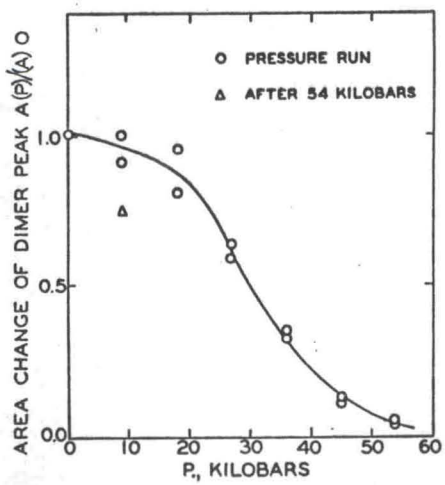

FIG. 15. Area change of dimer absorption peak vs pressure—acridine orange in boric acid—5.4×10^{-4} g/g.

[14] V. Zanker, J. Phys. Chem. **200**, 250 (1952).