effects at the 9-position were not observed in the pressure effect.

Pressure dependences of k_{is} for disubstituted anthracenes in *n*-hexane and toluene

The results of similar measurements in *n*-hexane and toluene for anthracenes disubstituted at a side ring are shown in Figs. 7–10. For these compounds, in which S_1 probably lies above T_2, the distinct differences in the pressure dependences of k_{is} between *n*-hexane and toluene are still seen.

Changes in k_{is} during systematic variations in the S_1-T_2 gap by solvent and pressure

The feature of pressure dependences of k_{is} in different solvents may be qualitatively explained by Fig. 11. It shows how k_{is} changes with a systematic lowering of S_1 caused by solvent and pressure in the region where there is a peak in the Franck-Condon factors (see Fig. 1). The original points in arrows express the situations at normal pressure in each solvent. The motion of an arrow shows the pressure dependence of k_{is} in the solvent. To ascertain the changes in k_{is} predicted by this figure, similar measurements in other several solvents were made for anthracene and 1-, 2- and 9-methylanthracene. The results are shown in Figs. 12–19. As seen in Table 1, the energies of S_1 change in the order of *n*-hexane>methylcyclohexane>a mixture of *n*-hexane and toluene (1 : 1 in volume at normal pressure)>toluene>tetraline. *Anthracene:* As S_1 is lowered by solvent and pressure, at first k_{is} scarcely changes and then begins to increase rapidly and thereafter the rate of the increase becomes

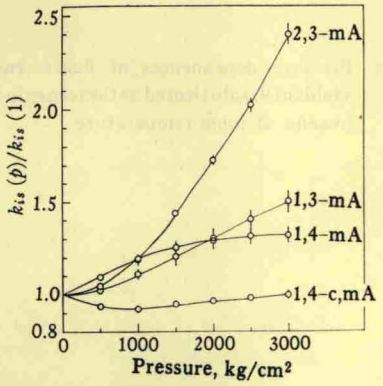

Fig. 9. Pressure dependences of intersystem crossing rates of disubstituted anthracenes in *n*-hexane at room temperature.

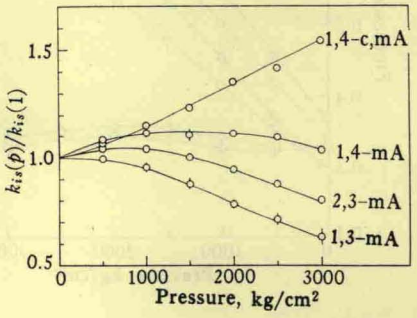

Fig. 10. Pressure dependences intersystem crossing rates of disubstituted anthracenes in toluene at room temperature.

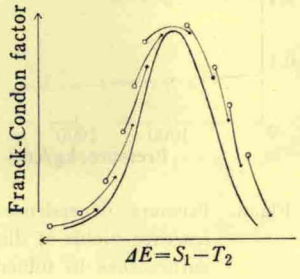

Fig. 11. Scheme showing the effects of solvent and pressure on k_{is}. See the text.

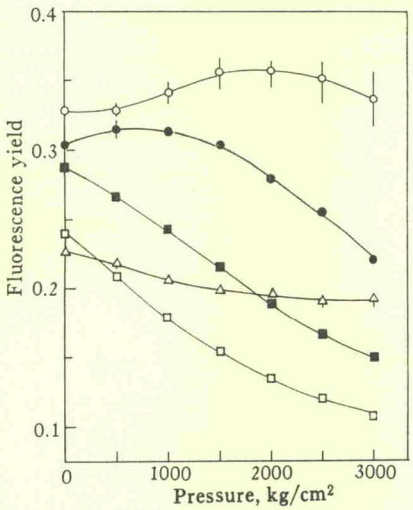

Fig. 12. Pressure dependences of fluorescence yields of anthracene in various solvents at room tempera ture.
○ *n*-hexane,
● methylcyclohexane,
■ *n*-hexane+toluene (1 : 1 in volume at normal pressure),
□ toluene, △ tetraline.
The symboles are common in Figs. 12–21.

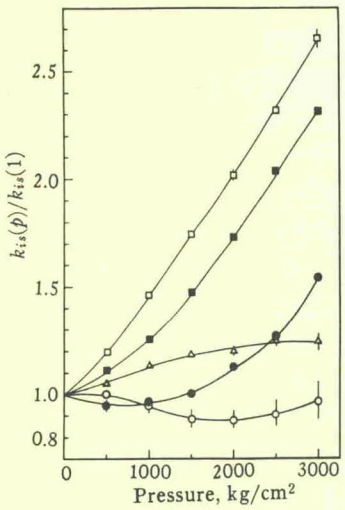

Fig. 13. Pressure dependences of intersystem crossing rates of anthracene in various solvents at room temperature.

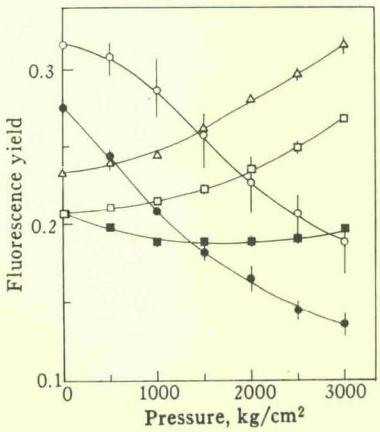

Fig. 14. Pressure dependences of fluorescence yields of 2-methylanthracene in various solvents at room temperature.

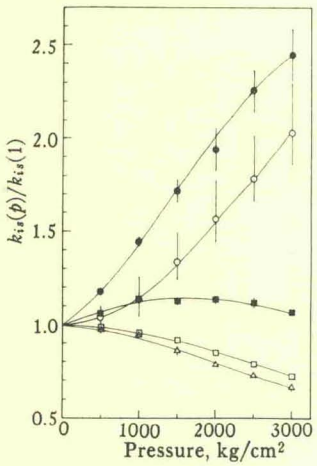

Fig. 15. Pressure dependences of intersystem crossing rates of 2-methylanthracene in various solvents at room temperature.