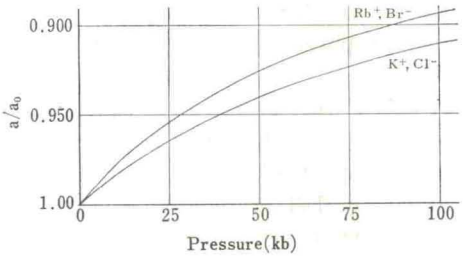

Fig. 9 a. The ionic radii in the NaCl structure as a function of pressure.

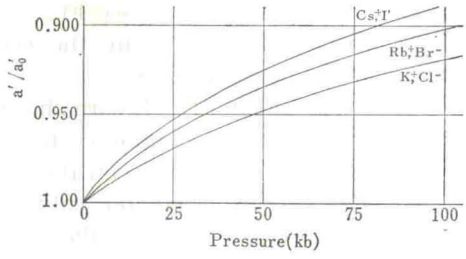

Fig. 9 b. The ionic radii in the CsCl structure as a function of pressure.

which include the factors of exp $(-r/p_A)$. exp $(-r/p_X)$ and $(-r/p_{AX})$ respectively. Here p is the function of the effective charge of the nucleus for the outermost electrons of the alkali metal ion A and its principal quantum number. Similarly p_X depends on the halide ion X and P_{AX} depends on the two ions. However the precise form of the repulsive term including these factors may be very complicated. Whereas, the simple expression (1) gives good results. Therefore we may consider the repulsive term in the expression (1) as the average of those complicated expression. Moreover p in the eq. (1) is a constant value, so, we may consider that the effective charges of the nuclei for the outermost electrons are nearly independent of pressure. And we can calculate the ionic radii at high pressure following Pauling[9]. Fig.'s 9a and 9b show the results, in which the ionic radii in the NaCl structure and the ionic radii in the CsCl structure are given as a function of pressure.

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3. Effect of Pressure on the Eutectic Temperature of Bismuth-Cadmium System up to 30kb

The sample assembly for this investigation is shown in Fig. 2(c) in chapter 1. The pressure calibration at room temperature was used in this high temperature (up to 500°C) experiment, because the frictions may be almost same as

that at room temperature (See Fig. 4 in chapter 1). The same bismuth as that in chapter 1 was used again, the cadmium (prepared by Junsei Kagaku Co., Ltd.) had the purity of 99.9%.

The experimental results are shown in Fig.'s 1, 2(a) and 2(b). Fig. 1, shows the phase diagram of cadmium, our result agrees with that of Kennedy[1] quite well. The effect of pressure on the eutectic temperature is shown in Fig.'s 2(a) and 2(b). The experimental values obtained by D.T.A. technique were not sufficiently correct, especially the signals to determine the solidification curves

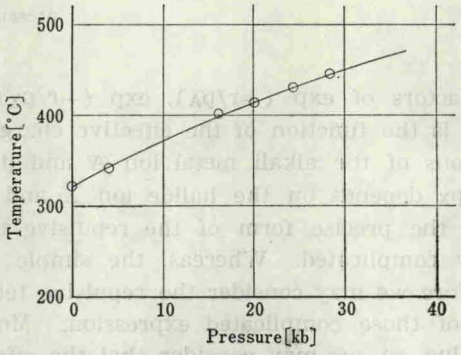

Fig. 1. The phase diagram of cadmium. The solid curve was the observed one by Kennedy[1] and circles show our results.

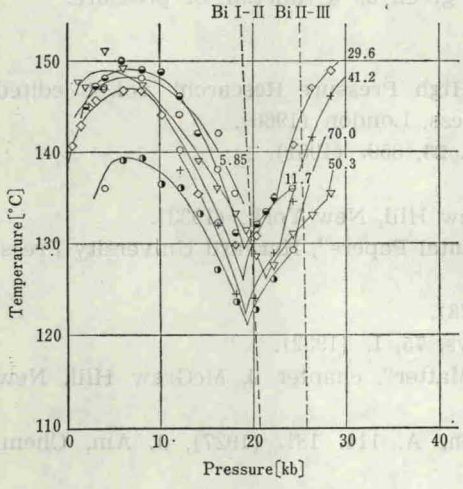

Fig. 2-(a). The effect of pressure on the eutectic temperature of Bi-Cd system. Numerical values show the weight percentages of cadmium. The results in 6 runs of 11 runs are given to avoid unimportant complexity.

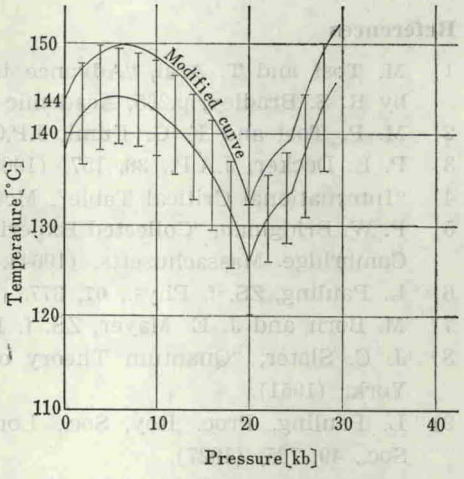

Fig. 2-(b). The lower curve shows the average of the direct experimental results (Fig. 2-(a)) and the upper curve shows its modification which was obtained by its parallel displacement.