structure analysis made by means of the Fourier transformation of amplitude distribution using the φ-functions given by (2).

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Thermal expansion of sodium fluoride and sodium bromide.

By V. T. DESHPANDE, *Physics Department, University College of Science, Osmania University, Hyderabad-7, India*

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Published reports on the thermal expansion of sodium fluoride and sodium bromide are few and restricted in scope. (See Krishnan, 1958). On NaF the only results available are those of Henglein (1925) for low temperatures and the room-temperature values quoted by Megaw (1939) and Wooster (1949). For NaBr, besides Henglein's (1925) work there are reports from Baxter & Wallace (1916) and Straumanis, Jevins & Karlsons (1938). The former give average values of cubical expansion for the ranges of temperature 0–25 °C. and 25–50 °C., and the latter give the coefficient of expansion between 15 and 60 °C. as obtained by X-ray method. Recently the author (Deshpande, 1955) has studied both these halides at elevated temperatures by the X-ray method, and the results are reported below.

The experimental set-up and the computational procedure have been described elsewhere (Deshpande & Mudholker, 1960; Deshpande & Sirdeshmukh, 1961). The only special feature of the present work is the hygroscopic nature of NaBr. With careful drying over P_2O_5 in a vacuum dessicator and the use of an air-tight cellophane cover on the specimen, it was possible to obtain quite satisfactory results.

Table 1. *Lattice constants of* NaF *and* NaBr *at different temperatures*

Temperature	Lattice constant of NaF	Temperature	Lattice constant of NaBr
29·6 °C.	4·6340 Å	31·5 °C.	5·9738 Å
68·1	4·6400	82·7	5·9879
108·0	4·6466	119·4	5·9985
148·0	4·6537	160·0	6·0110
176·0	4·6585	252·0	6·0389
208·0	4·6648	—	—
254·0	4·6726	—	—

Lattice constants of the two salts at various temperatures are given in Table 1. The estimated accuracy of the values is $\pm 0{\cdot}0001$ Å. Table 2 gives the coefficients of thermal expansion as defined by $\alpha = 1/a_{20}(\Delta a/\Delta t)$. Least-squares treatment of the $\alpha - t$ data gives the following equations for the temperature dependence of the coefficients of thermal expansion.

Table 2. *Coefficients of thermal expansion of* NaF *and* NaBr

Temperature	NaF α (exp.)	NaF α (calc.)	NaF Δα	NaBr α (exp.)	NaBr α (calc.)	NaBr Δα
30 °C.	34·00	34·00	0·0	44·84	44·84	0·0
70	34·75	35·17	+0·42	46·89	46·41	−0·48
110	36·60	36·34	−0·26	47·90	47·93	+0·03
150	37·78	37·51	−0·27	49·24	49·70	+0·46
190	38·86	38·68	−0·19	51·83	51·42	−0·41
230	39·94	39·85	−0·09	53·18	53·09	−0·09
250	40·04	40·43	+0·39	—	—	—

NaF:

$$\alpha = 33{\cdot}13 \times 10^{-6} + 29{\cdot}20 \times 10^{-9}.t.$$

NaBr:

$$\alpha = 43{\cdot}69 \times 10^{-6} + 37{\cdot}77 \times 10^{-9}.t + 15{\cdot}21 \times 10^{-12}.t^2.$$

Values calculated from these equations are also given in Table 2 along with the differences between the experimental and calculated values. The differences are all about 1%.

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