Table 2. *Lattice energies of the alkali halides from heats of sublimation and vapour phase ionic dissociation*

(Values in kcal./mole; probable error of U_e values c. ±3 kcal.)

	λ_0	Q_0	U_e
LiCl	50·6(a)	150·7(d)	201·3
LiI	48·8(c)	129·1(f)	177·9
NaCl	55·0(a, b)	129·7(d)	184·7
NaBr	53·0(a, b)	124·7(e)	177·7
NaI	47·9(c)	118·8(g)	166·7
KCl	52·9(a, b)	113·5(d)	166·4
KBr	51·9(a, b)	109·3(e)	161·2
KI	49·0(a)	102·4(g)	151·4
	49·0(a)	104·6(h)	153·6
RbI	46·1(a)	99·1(f)	145·2
CsI	(48)	94·8(h)	142·8

Data from (*a*) Niwa, 1938; (*b*) Mayer & Winter, 1938; (*c*) Rossini *et al.*, 1952; (*d*) Saha & Tandon, 1937; (*e*) Tandon, 1937*a*; (*f*) Srivistava, 1938; (*g*) Tandon, 1937*b*; (*h*) Mayer, 1930.

within ±1·5 kcal. Similarly, the lattice energies of the rubidium salts approximate to the mean of the lattice energies of the corresponding potassium and caesium salts, even though CsCl, CsBr and CsI have a different crystal structure from the other alkali halides. In addition, the difference between the lattice energies of the chloride and bromide of a given alkali metal is practically constant (6±2 kcal.), as also is the difference between the lattice energies of the bromide and iodide (10±3 kcal.).

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The unit cell and space group of barium tetratitanate, $BaO\,.\,4\,TiO_2$.*

By F. W. Harrison,† *College of Mineral Industries, The Pennsylvania State University, University Park, Pa., U.S.A.*

(*Received* 7 *December* 1955)

The compound $BaO\,.\,4TiO_2$ has been prepared by Rase & Roy (1955) during phase investigations in the system $BaO–TiO_2$. It grows as small needle-shaped crystals several millimetres in length from mixtures of 80 molar % TiO_2 reacting in the solid phase below 1400° C.

Rotation and Weissenberg photographs of an untwinned crystal have shown the unit cell to be orthorhombic with dimensions

$$a = 3{\cdot}79 \pm 0{\cdot}01,\ b = 14{\cdot}51 \pm 0{\cdot}04,\ c = 6{\cdot}30 \pm 0{\cdot}02\ \text{Å}\,,$$

where a is parallel to the length of the needle, and b and c are parallel to the edges of its rectangular cross-section.

The only systematic absences observed are $hk0$ when $h+k$ is odd, suggesting that the space group is either $P–mn$, $Pm–n$, or $Pmmn$.

The observed density of 4·6 g.cm.$^{-3}$, measured by pycnometer, agrees well with a value of 4·54 g.cm.$^{-3}$ calculated on the basis of 2 formula units per unit cell.

The short axial distance of 3·79 Å corresponds approximately with the distance between opposite apices of TiO_6 octahedra found in other compounds, suggesting that strings of such octahedra are linked corner to corner parallel to the a axis.

A structure determination on this compound is not contemplated.

Reference

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* Contribution No. 54–3 from the College of Mineral Industries, The Pennsylvania State University; work supported by the U.S. Army Signal Corps under Contract DA-36-039sc5594.

† Now at Mullard Research Laboratories, Cross Oak Lane, Salfords, near Redhill, Surrey, England.