investigating the variation of ultrasonic velocity with temperature in aqueous solutions of certain inorganic sulphates, Marks[4] found that the velocity–temperature curves are similar to those of water but displaced towards lower temperatures with increase in concentration. In the light of this earlier observation, the curves for the melts of sodium and lead acetates and calcium nitrate appear to be similar to the latter half of velocity-temperature curves of highly concentrated aqueous solutions, the maxima of which have been displaced considerably towards lower temperatures. It is interesting to note that the velocities in molten lead acetate are less than that of water. This behaviour is similar to that of other aqueous solutions of lead salts, as reported by Bärthel[5] and Krishnamurty[6]. The most unusual variation of ultrasonic velocity with temperature is observed in the case of double salt sodium–potassium tartrate, which shows a maximum at 75° C. which is very near the temperature of maximum velocity of water. A similar maximum is observed less prominently in the case of melt of aluminium nitrate. The behaviour of both these salts is unusual and needs further investigation in detail.

The values of molar sound velocity R are calculated at different temperatures, and it is found that for each salt R is independent of temperature. The maximum change, which is about 2 per cent, is observed only in the case of sodium–potassium tartrate. It may be noted that this temperature-independence of molar sound velocity has not been reported previously. Considering the molten hydrated salt as a highly concentrated aqueous solution of the salt in its own water of hydration and assuming linear variation of R with concentration at least in the

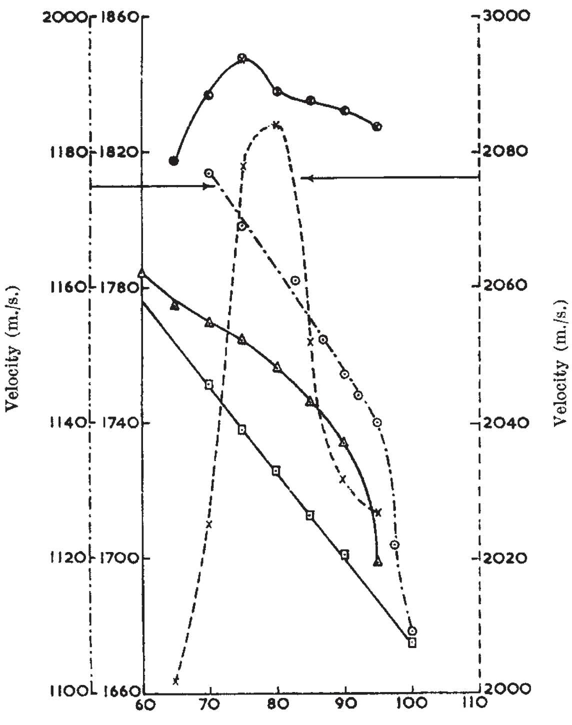

Fig. 1. Variation of ultrasonic velocity with temperature in molten hydrated salts. ⊗, Aluminium nitrate; ×, sodium potassium tartrate; △, calcium nitrate; ⊙, lead acetate; ⊡, sodium acetate

Table 1

Salt	Cm. (per cent)	R for hydrated salt	R for dehydrated salt	Computed value for salt	Computed value of R for new element
Sodium acetate	25	315	634	680	—
Sodium–potassium tartrate	20	438	1,350	1,329	—
Aluminium nitrate	10	295	1,060	—	Al = 319
Calcium nitrate	25	391	934	—	Ca = 436
Lead acetate	25	412	1,018	—	Pb = 127

higher concentration-range, the values of R for each salt are obtained by extrapolating to 100 per cent concentration and these values are given in Table 1. Computed values of R for the first three salts using previously estimated[7] values of R for the individual elements showed good agreement with the experimental values, thus justifying the procedure adopted here for calculating R for the pure salts from those of molten hydrated salts. The values of R for the last three salts in Table 1 are utilized for calculating R values for the metals aluminium, calcium and lead and have been given in the last column. It may be noted that the values of R for these three metals are obtained for the first time.

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Neutron 'Flux'

Mr. Stretch[1] objects to the use of the term 'neutron flux' because the entity specified is a scalar, the movement of neutrons involved being random instead of a directed flow ; he contrasts this with the usage of the word 'flux' for a vector quantity. This usage, as in 'heat flux', is, however, already a degenerate form. Though now often used with a vectorial meaning, 'flux' was originally a scalar, albeit derived from a vector. The original meaning, which is still the customary one in electrical theory, is 'the surface integral of the normal component of a vector', and this is a scalar. It is this mathematical concept, surely, that should be the standard of orthodoxy.

The suggestion of replacing 'neutron flux' by 'neutron potential' is open to the objection that it already has a different meaning when considering the interaction of a neutron with another particle.

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