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ABSTRACT

Dipole moments are given for the three lowest vibrational states of LiF, LiCl, NaCl, NaBr, NaI, KCl, RbF, RbCl, CsF, and CsCl.

Over a period of several years we have made rather accurate measurements of the dipole moments of a number of alkali halide molecules by the molecular beam electric resonance method. Our particular interest in these measurements was largely motivated by attempts to improve[1,2] the simple ionic model of the gaseous alkali halide molecules, however they may be of some interest for other reasons also.

A description of the apparatus used, the method of reducing the data, and some results for other alkali halides have been published previously;[3,4,5] so in the interests of economy of space only the results are given here. More detailed accounts of these measurements are available in a series of unpublished University of California Lawrence Radiation Laboratory Reports. Reference to these is given in Table I.

Dipole moments for some of the molecules (NaBr, NaI, and RbCl) have not been reported previously, others represent only some improvement in the accuracy of measurement. Since the principal source of disagreement between dipole measurements made in different laboratories is likely to arise from uncertainties in the value of the Stark field used, we have included in Table I our measurements on LiF and KCl. LiF has been previously measured at Harvard[6] and KCl has been recently measured at Nijmegen.[7] A comparison of these results indicates that independent Stark field measurements at Harvard, Nijmegen, and Berkeley are in excellent agreement.