

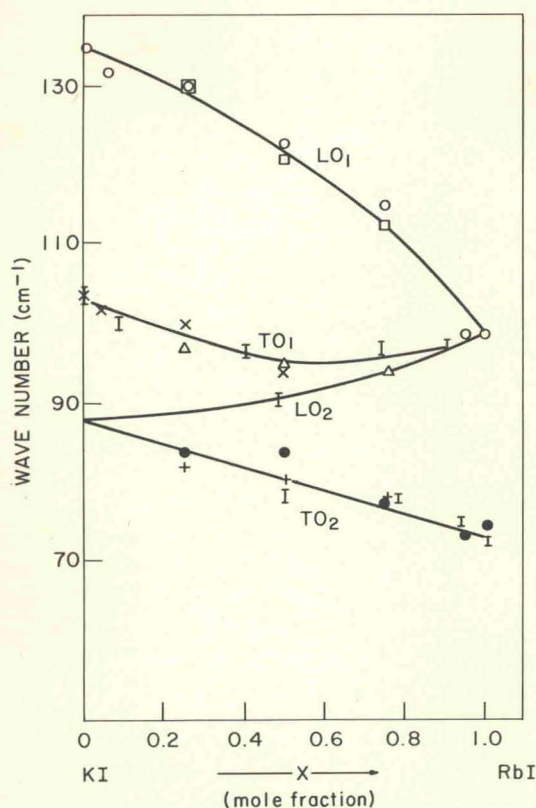


FIG. 5. Variation of long-wavelength LO and TO phonon frequencies of $K_{1-x}Rb_xI$ at STP with composition. Sources of experimental data are LO frequencies from Ref. 10 [$\circ$ (reflection), $\square$ (thin film)] and TO frequencies from Ref. 10 [$+$, $\bullet$ (reflection) and Δ , $\times$ (thin film)]; I [present study (Table II)]. Lines are expected results of MREI model (Ref. 19) assuming that the local-mode frequency is coincident with the LO frequency of RbI (103 cm^{-1}).

changes the force constants, affecting KI and RbI slightly differently, the system probably even becomes entirely a one-mode system. The present experimental data support this view. However, this conclusion may not entirely be true because of the ambiguity in the spectrum arising from the presence of bands corresponding to the high-pressure phase (CsCl structure) as well as the system. It is also not known whether the transition pressure is a linear function of composition for the mixed crystal.

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¹S. S. Mitra, C. Postmus, and J. R. Ferraro, Phys. Rev. Letters 18, 455 (1967).

²C. Postmus, J. R. Ferraro, and S. S. Mitra, Phys. Rev. 174, 983 (1968).

³C. Postmus, J. R. Ferraro, and S. S. Mitra, Inorg. Nucl. Chem. Letters 4, 55 (1968).

⁴S. S. Mitra, O. Brafman, W. B. Daniels, and R. K. Crawford, Phys. Rev. 186, 942 (1969). For a review of infrared and Raman techniques see S. S. Mitra, in *Proceedings of the International Colloquium on Les Propriétés Physiques des Solides sous Pression, Grenoble, France, 1969* (CNRS, Paris, 1970), pp. 65–73.

⁵J. F. Vetelino, S. S. Mitra, and D. V. Namjoshi, Phys. Rev. B 2, 967 (1970).

⁶J. F. Vetelino, S. S. Mitra, and D. V. Namjoshi, Phys. Rev. B 2, 2167 (1970).

⁷J. F. Vetelino, K. V. Namjoshi, and S. S. Mitra, J. Appl. Phys. 41, 5141 (1970).

⁸J. R. Ferraro, C. Postmus, S. S. Mitra, and C. Hoskins, Appl. Opt. 9, 5 (1970).

⁹J. R. Ferraro, S. S. Mitra, C. Postmus, C. Hoskins, and E. C. Siwec, Appl. Spectry. 24, 187 (1970).

¹⁰J. H. Fertel and C. H. Perry, Phys. Rev. 184, 874 (1969).

¹¹J. R. Ferraro, S. S. Mitra, and C. Postmus, Inorg. Nucl. Chem. Letters 2, 269 (1966).

¹²S. S. Mitra, in *Optical Properties of Solids*, edited by S. Nudelman and S. S. Mitra (Plenum, New York, 1969), pp. 333–451.

¹³S. S. Mitra and R. Marshall, J. Chem. Phys. 41, 3158 (1964).

¹⁴C. E. Weir and G. J. Piermarini, J. Res. Natl. Bur. Std. 68A, 105 (1964).

¹⁵S. S. Mitra, Phys. Status Solidi 9, 519 (1965).

¹⁶S. S. Mitra and K. V. Namjoshi J. Chem. Phys. (to be published).

¹⁷M. Cardona (private communication).

¹⁸G. Lucovsky, E. Burstein, and M. Brodsky, in *Proceedings of the International Conference on Localized Excitations in Solids* (Plenum, New York, 1968).

¹⁹I. F. Chang and S. S. Mitra, Phys. Rev. 172, 924 (1968).

²⁰L. Genzel (unpublished).

²¹M. H. Brodsky, G. Lucovsky, M. F. Chen, and T. S. Plaskett, Bull. Am. Phys. Soc. 15, 382 (1970).