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# STRUCTURAL PHASE TRANSITIONS IN $Rb_2KFeF_6$ AND $Rb_2KYF_6$ ELPASOLITES

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The elpasolite-type compounds $Rb_2KFeF_6$ and $Rb_2KYF_6$ undergo a structural phase transition at 175 K and 398 K, respectively, from a high-temperature cubic phase ($Fm3m$) to a tetragonal - or pseudo-tetragonal - distorted low-temperature phase. These transitions have been studied on powdered samples and on single crystals using DSC, X-ray diffraction and Raman scattering techniques. The group to sub-group relations are proposed, which lead to the "family tree" of the elpasolite series.

$Rb_2KYF_6$ : the space group of the low-temperature phase of $Rb_2KYF_6$ is either $P12_1/n1$ or $P112_1/n$. It can be assumed that the transition is of first order although it is apparently continuous. This transition, which is probably of the "triggered" -type, is induced by an order-disorder process. In the cubic phase of $Rb_2KYF_6$ the orientational disorder of the $YF_6^{+}$ octahedra may be coupled with a positional disorder of the $Rb^{+}$ cations in CN = 12.

$Rb_2KFeF_6$ : on the basis of both group-theory considerations and experimental data, it may be assumed that P4/m, P2/m, $P112_1/n$ and P1 space groups are candidates for the low-temperature phase of $Rb_2KFeF_6$. On the basis of the present data, the strong first-order character of this transition does not allow any further hypothesis on the involved transition mechanism.