

Soft Mode Intensities for KTaO_3 and $(1-x)\text{Pb}(\text{Zn}_{1/3}\text{Nb}_{2/3})\text{O}_3-x\text{PbTiO}_3$

There are three types of vibrations considered in Perovskite ABO_3 : the S1-Slater mode in which B atom vibrates against O_6 octahedron, the S2-Last mode in which the A atom vibrates out of phase with the BO_6 group and the S3 mode which consists of a distortion of the oxygen octahedron. The soft modes in perovskites have been described by J. Harada et al. (*Acta Cryst.* **A26**, 608 (1970)) who have shown that it primarily involves the S1 mode and, to a much weaker extent, the S2 mode. Therefore we have only considered the S1 and S2 modes with the condition of zero center of mass motion. In order to reduce the problem to a one-parameter problem, we have taken the relative ratio $S=S_2/S_1$ and calculated the inelastic intensities for different Q's.

The calculated inelastic intensities for KTaO_3 and $(1-x)\text{Pb}(\text{Zn}_{1/3}\text{Nb}_{2/3})\text{O}_3-x\text{PbTiO}_3$, up to an arbitrary normalization factor, are plotted in the figure below as a function of the parameter S.

