



Calculation of the Raman Frequencies Using Volume Data Close to the Tricritical and Second Order Phase Transitions in NH_4Cl

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We calculate here the Raman frequencies of the ν_5 TO (174 cm^{-1}) and ν_2 (1708 cm^{-1}) modes as a function of temperature in the region of the tricritical ($p = 1.6 \text{ kbar}$) and the second order ($p = 2.8 \text{ kbar}$) phase transitions in NH_4Cl . This calculation of the Raman frequencies is performed through the mode Grüneisen parameter by using the experimental length-change data obtained at zero pressure where the NH_4Cl crystal exhibits a first order phase transition ($T_\lambda = 242 \text{ K}$). The predicted Raman frequencies of the modes studied here, agree with our observed frequencies for the tricritical ($T_c = 257 \text{ K}$) and second order ($T_c = 268 \text{ K}$) transitions in NH_4Cl .

This indicates that the Raman frequencies can be predicted from the measurements of the crystal volume close to phase transitions by the method given here.