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ABSTRACTS

PICOSECOND CARS STUDY OF PHONON ENERGY RELAXATION IN IONIC CRYSTALS

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Vibrational relaxation is measured in ionic crystals at various temperatures by picosecond CARS spectroscopy. Crystals studied were: K_2SO_4, $CaCO_3$.

As far as K_2SO_4 is concerned, the coherence decay of the phonons at 44[illegible], [illegible]7, 98[illegible], 10[illegible] and 114[illegible] cm^{-1} showed different behaviours with temperature.

The decay time of the 44[illegible] cm^{-1} mode ranges from [illegible] ps at [illegible] K to [illegible] ps at 10[illegible] K showing a quadratic dependence of the inverse of the decay time with temperature. The decay of the phonon at [illegible] cm^{-1} can be detected only at low temperature with a life-time of about [illegible] ps at [illegible] K. The phonon at [illegible] cm^{-1} shows instead a longer decay time which can be measured in a wide range of temperature from [illegible] K ([illegible] ps) to room temperature ([illegible] ps). In this case the dependence of the inverse lifetime with temperature is linear above 40 K being almost temperature independent below this temperature.

The decay of the 108[illegible] cm^{-1} totally symmetric stretching mode of $CaCO_3$ has been measured to be [illegible] ps at [illegible] K.

This result compares well with the lifetime value reported by Laubereau and Kaiser, i.e. [illegible] ps at [illegible] K.