

ULTRASONIC STUDIES OF ELASTIC PROPERTIES OF LITHIUM YTTRIUM FLUORIDE

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ABSTRACT

Mechanical properties (elastic constants, elastic compliances, Bulk modulus, Young modulus and linear compressibilities) of fluoride scheelite LiYF_4 which belongs to TII Laue crystals have been measured at room temperature using ultrasonic pulse superposition technique. The sign of C_{16} is found to be negative.

For all directions in the [001] plane there is a root $\rho V^2 = C_{44}$ to the Christoffel equation which corresponds to a pure shear mode with particle motion along the [001] direction. For all propagation direction in the (001) plane, the sum of the squares of the velocities of the quasi – longitudinal and quasi – shear modes is equal to $(C_{11} + C_{66})/\rho$. The present results have been compared with previous experimental and theoretical results and with some oxide scheelites.

KEYWORDS: Elasticity; Lithium Fluoride; Oxide Scheelites