

Abstract Submitted
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Infrared properties of the bismuth pyrochlores¹ MINGHAN CHEN, DAVID TANNER, Dept. of Physics, University of Florida, JUAN NINO, Dept. of Materials Science and Engineering — We measured the temperature dependence of the reflectivity spectra of cubic bismuth pyrochlores $\text{Bi}_{3/2}\text{ZnTa}_{3/2}\text{O}_7$ (BZT), $\text{Bi}_{3/2}\text{MgNb}_{3/2}\text{O}_7$ (BMN), $\text{Bi}_{3/2}\text{MgTa}_{3/2}\text{O}_7$ (BMT) and $\text{Bi}_{3/2}(\text{Zn}_{0.92}\text{Nb}_{1.5})\text{O}_{6.92}$ (BZN) by infrared spectroscopy from 30 to 3300 cm^{-1} between 50 and 300K. The optical constants were estimated by Kramers-Kronig analysis and classical dispersion theory. Infrared-active phonon modes were assigned to specific bending and stretching vibrational modes. Of particular interest is a previously unassigned IR mode at $\sim 850 \text{ cm}^{-1}$ which may suggest a complex structure. Splitting of the B-O and O-B-O stretching phonons is attributed to mixed cation occupancy. The temperature dependences of the phonon frequencies and the damping coefficients indicate a decrease of lattice constant and orientation disorder at low temperatures.

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