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Raman study of the phonon modes in bismuth pyrochlores[1]
DANIEL ARENAS, WEI QIU, JUAN NINO, DAVID TANNER, University of Florida, LEV GASPAROV, University of North Florida — The Raman Spectra of the cubic bismuth pyrochlores $Bi_{3/2}Zn_{0.92}Nb_{1.5}O_{6.92}$, $Bi_{3/2}ZnTa_{3/2}O_7$, $Bi_{3/2}MgNb_{3/2}O_7$, and $Bi_{3/2}MgTa_{3/2}O_7$ were measured. The samples, in ceramic form, were measured from 50 to 1000 cm^{-1} at room temperature. The Raman bands were tentatively assigned to specific vibrational modes. Overall, the Raman spectra were similar for all four samples and the number of modes was affected by the displacement disorder in the bismuth-based compounds. The results will also be compared to published infrared data to gain insight into these additional modes. Last, the existence of an 860 cm^{-1} mode in BZN and BMN will be discussed as it suggests influence of the lone pair character on the displacement disorder.

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