Infrared reflection spectra of MnxFe1–xIn2S4 solid solutions

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Abstract: Large-block crystals of FeIn2S4 and MnIn2S4 ternary compounds and MnxFe1–xIn2S4 solid solutions are grown by directional crystallization (horizontal Bridgman method). The structures of the obtained crystals are determined by x-ray diffraction analysis. Both the starting compounds and the solid solutions based on them are shown to crystallize in the cubic spinel structure. IR reflection spectra in the range 50–500 cm–1 of crystals of FeIn2S4 and MnIn2S4 ternary compounds and FexMn1–xIn2S4 solid solutions are studied. The frequencies of transverse (ωTO) and longitudinal (ωLO) optical phonons are determined. The concentration dependences of these parameters are plotted. The nature of their behavior is established.

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