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Accession Number

12250695

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Title

Inelastic neutron and low-frequency Raman scattering in a niobium-phosphate glass for Raman gain applications

Source

Journal of Non-Crystalline Solids, vol.357, no.2, 15 Jan. 2011, 506-9. Publisher: Elsevier Science B.V., Netherlands.

Abstract

We present measurements of the vibrational spectrum of a binary niobium-phosphate glass in the THz frequency range using inelastic neutron and Raman scattering. The spectra of these glasses show a low-frequency enhancement of the vibrational density of states ("boson peak"). Using a recently developed theory of vibrational excitations in disordered solids we are able to reconcile the measured neutron and Raman spectra using fluctuating elastic and Pockels constants as a model concept. As the spontaneous Raman susceptibility is a key parameter for Raman amplification our results suggest a significant gain profile for application of niobium-phosphate glasses in Raman amplifiers. [All rights reserved Elsevier]. (18 References).