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Title:Optimal Te-doping in GaSe for non-linear applications

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Abstract:Centimeter-sized Te-doped GaSe ingots were grown from the charge compositions of GaSe with nominals 0 05. 0.1, 0.5, 1, and 3 mass% Te, which were identified as ϵ-GaSe:Te (0.01, 0.07. 0.38. 0.67. and 2.07 mass%) single crystals. The evolution of the absorption peaks of the phonon modes E'⁽²⁾ (~0.584 THz) and E''⁽²⁾ (1.77 THz) on Te-doping in GaSe:Te crystals was studied by THz time-domain spectroscopy. This study proposes that the evolution of both E'⁽²⁾ and E''⁽²⁾ absorption peaks correlates well with the optical quality of Te-doped GaSe crystals, which was confirmed by experimental results on the efficiency of THz generation by optical rectification. Maximal intensity of the absorption peak of the rigid layer mode E'⁽²⁾ is proposed as a criterion for identification of optimal Te-doping in GaSe crystals.

Number of references:26

Inspec controlled terms:gallium compounds - III-VI semiconductors - ingots - nonlinear optics - optical materials - semiconductor doping - tellurium - terahertz wave spectra

 $\label{eq:controlled terms:ingots - absorption peaks - phonon modes - THz time-domain spectroscopy - E''<\!\!sup>\!(2)<\!\!/sup>$ absorption peaks - E'<\!\!sup>\!(2)<\!\!/sup> absorption peaks - optical rectification - rigid layer mode - GaSe:Te

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Chemical indexing:GaSe:Te/ss GaSe/ss Ga/ss Se/ss Te/ss GaSe/bin Ga/bin Se/bin Te/el Te/dop Treatment:Experimental (EXP)

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