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Title:Improving the laser-induced-damage tolerance characteristics of 4-dimethylamino-N-methyl-4-stilbazoliumtosylate crystals for THz wave generation by annealing
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Abstract:We demonstrated that annealing 4-dimethylamino-N-methyl-4- stilbazoliumtosylate (DAST) crystals near their melting point improves their tolerance to laser-induced damage. Their laser-induced-damage tolerance characteristics were evaluated and confirmed using differencefrequency THz generation. The DAST crystals employed in this study were all approximately the same size. THz wave output did not decrease in DAST crystals that were about 80% annealed. Microscopy images revealed that the crystallinity and orientation of the DAST crystal were improved by annealing. Moreover, THz wave output in the DAST crystal plane was uniformized by annealing. Further, annealed DAST crystals with superior laser-induced-damage tolerance produced 10 times greater THz wave output at a power density of 1.5GW/cm² than did unannealed crystals at a much greater power density. Therefore, the laser-induced-damage tolerance characteristics of DAST crystals were successfully improved by annealing. © 2012 The Japan Society of Applied Physics.
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