Abstract

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Archives in Chemistry

2022
Vol 3. No. 6

Heterocyclic chiral additive based MAPbBr3-xClx single crystals: Synthesis, UV-visible and terahertz optical properties, applications in generation of higher-order harmonics

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Abstract

Mixed-halide perovskite materials are promising candidates for photonic applications due to their tunable bandgap and enhanced optoelectronic properties. Unfortunately, phase segregation in these materials severely impacts their scalability. Additive engineering strategy in most perovskite crystal growth has proved more effective. Current work focuses on MAPbBr3-xClx (MH) single crystals towards laser stability using nitrogen-based additives. These additives assist in forming high surface quality crystals along with mitigate phase segregation by increasing the crystallinity at the nano-level. The dependence of morphology and optical properties concerning additives is demonstrated besides unveiling its importance on the crystallinity, surface passivation, and stability in MH single crystals towards the laser. The additive engineering strategy showed a clear impact on terahertz (THz) transmission and reflection properties and generation of higher-order harmonics from their laser induced plasma plumes.

Received Date: 10 July, 2022 **Accepted Date:** 17 July, 2022 **Published Date:** 29 July, 2022

Biography

Dr. Srinivasa Rao Konda received his Ph.D. in November 2016 and won the Indian Laser Association “Best Thesis Award” in National Laser Symposium -25. His main achievements are attending the Meeting of National Innovation Clubs (FION-2017) on Mar. 8, 2017 at Rashtrapati Bhavan, New Delhi. Until now he published 54 influential peer-reviewed articles and 1 monograph in his research carrier. In addition, he is servicing as a reviewer and editorial board member for various well reputed journals. Dr. Rao currently works in GPL Photonics Laboratory and his research work is focused on simultaneous generation of higher order harmonics and terahertz generation from novel materials. Also, he built the terahertz (THz) generation and detection scheme and working on THz time domain spectroscopy of newly synthesized materials to obtain their nonlinear optical properties.

