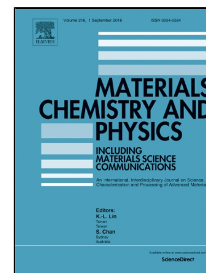


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Structural, multichannel sensing and optical properties of 2-aminopyridinium diphenylacetate diphenylacetic acid crystal

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Abstract

2-aminopyridinium diphenylacetate diphenylacetic acid (2APD), an organic crystal with dimensions 22 x 13 x 11 mm³ was grown by slow cooling technique. The structural aspects of the grown crystal have been confirmed by single crystal X-ray diffraction study. The title compound crystallizes in the monoclinic crystal system with noncentrosymmetric space group P2₁. The intermolecular hydrogen bonding interactions has been analysed by Hirshfeld surface analysis. Chemosensors for a charge transfer molecule has been reported for the first time in the literature. The cation and anion sensing study revealed that the title material exhibits a colour change in the presence of Cu²⁺ and Ni²⁺ while the solution remained colourless in the presence of anions. This further shows that the receptor acts as a luminescence sensor in the presence of Cu²⁺ and Ni²⁺ ions. The laser damage threshold of the 2APD sample measured along three different planes was found to be 0.76 GW cm⁻², 0.97 GW cm⁻² and 0.94 GW cm⁻². Z-scan measurements confirmed the third order nonlinear property of the grown 2APD crystal. The optical limiting behavior of the 2APD crystal is found to saturate with threshold and amplitude of 36 mW/cm² and 2.24 mW/cm² respectively.

Keywords: Crystal growth; Z-scan; Optical limiting Property.

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