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EFFECT OF DOPING OF KDP CRYSTAL WITH AMINO ACID L-ARGININE ON THE STRENGTH PROPERTIES AND CHARACTER OF LASER DAMAGE

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Abstract

Studied were the strength characteristics of KDP crystals doped with L-arginine under a concentrated load and irradiation of the first harmonic YAG:Nd^{3+} laser. The crystals were obtained by means of the temperature reduction method on a point seed, the content of L-arginine in the aqueous solution being 0.3, 0.4, 1.0 and 1.4 wt %. The character of the dependence of KDP microhardness versus the concentration of amino acid in the crystal was investigated. The regularities of brittle damage of the doped KDP crystal at mechanical testing and laser irradiation were shown to be similar. As confirmed in the study, the planes of easy crack extension in the crystal are {221}, (100), and (001) planes, the cracks mainly propagate parallel to {221} planes. The mechanical and laser strength values of doped KDP crystals were evaluated.

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