

Abstract Submitted
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Interrelations between superconducting properties and defect evolution in neutron irradiated $\text{YBa}_2\text{Cu}_3\text{O}_7$.¹ VIOREL SANDU, GHEORGHE ALDICA, National Institute of Materials Physics, ELENA SANDU, National Institute of Nuclear Physics and Engineering “Horia Hulubei”, PETRU NITA, METAV-Research and Development Bucharest — We investigated the effect of neutron irradiation on the electric and magnetic properties, including the enhancement of the critical current density, of ceramic $\text{YBa}_2\text{Cu}_3\text{O}_7(\text{LiF})_x$ samples. The superconducting properties of the virgin samples reach the optimal values for $x = 0.04$. Up to the same x value, the neutron irradiation up to 5×10^{17} neutrons/cm² enhances the superconducting response (critical temperature, transition width, etc) and double up the magnetic irreversibility. For $x \geq 0.08$, all the superconducting properties are depressed whereas the increase of the irreversible magnetization is still present but less spectacular. The analysis of this behavior suggests a self-organization of the defects at low LiF content while for $x \geq 0.08$ they are uniformly distributed within sample.

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