

## MAPbBr<sub>3</sub>-BASED RADIATION DETECTOR

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Recently the opportunity of using metalloorganic perovskites as a basic material for semiconductor detectors of ionizing radiation was demonstrated [1]. Presence of lead atoms make possible appearance of small size devices intended for personal dosimetry purposes. Crystal growing from solutions provides low cost of these devices [2]. Chlorine substituted methylammonium lead bromide perovskites MAPbBr<sub>3</sub>-xCl<sub>x</sub> was investigated in 2017 [3], and it was demonstrated by authors that the ratio of chlorine to bromine atoms has an impact on the energy resolution of MAPbBr<sub>3</sub>-xCl<sub>x</sub>-based detectors. At the present time MAPbBr<sub>3</sub>-xCl<sub>x</sub>-based detectors becomes comparable by practical characteristics to widespread scintillator-based detectors, whereas pure MAPbBr<sub>3</sub> doesn't allow obtaining energy resolution at all. Such a behavior demands investigation of the influence of structural and topological defects on electric properties and band structure of metalloorganic semiconductors. Electrical transport properties may be investigated by dielectric spectroscopy, which can provide information about impurity levels [4]. The purpose of this work was to obtain MAPbBr<sub>3</sub>-xCl<sub>x</sub> crystals by an original method, to study their transport properties using impedance and optical spectroscopy, to find out the possibility of their application in semiconductor detectors of ionizing radiation.

1. S. Yakunin et al., Nat. Photon. 10, 585 (2016).
2. W. Haotong et al., Nat. Commun. 10, 1066 (2019).
3. H. Wei et al., Nat. Mater. 16, 826 (2017).
4. K. Jonsher et al., Semicond. Sci. Technol. 1, 71 (1985).

### The speaker is a student or young scientist

Yes

### Section

1. Nuclear technology and methods in medicine, radioecology

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