

HYBRID PEROVSKITE/POLYMER MATERIAL. PREPARATION AND PHYSICOCHEMICAL PROPERTIES

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Abstract

Organic–inorganic hybrid perovskites are a promising class of processable semiconducting materials that combine the favorable properties of the inorganic semiconductor with the flexibility and low-temperature processability of the organic material [1].

Here, we report on the synthesis and investigation of the properties of a novel polymer-perovskite nanoparticles system based on LaMnO₃:Ag nanocrystals protected by sodium polyacrylate polymer. The mixture of LaMnO₃:Ag and sodium polyacrylate (1:20, m/m) were wet-triturated for 30 minutes, using water, until hydrogels were obtained. The resulting hydrogels were dried at 60 °C for 12 h and then mortared until obtaining a powder with particle dimensions up to 1 mm. Finally, the powder was subjected to another drying stage at 60 °C for 4 h.

The hybrid material was investigated by various characterization techniques, i.e. SEM/EDAX, X-ray diffraction, UV-VIS, FT-IR, and RAMAN spectroscopy. The obtained results confirm the formation of a novel polymer-perovskite nanoparticles system whose electrical and optical properties will be studied later.

References

[1] G.C. Papavassiliou, G.A. Mousdis, I. Koutselas, in: T.-C. Sum, N. Mathews (Eds.), *Halide Perovskites: Photovoltaics, Light Emitting Devices, and Beyond*, Wiley-VCH GmbH & Co.: Hoboken, NJ, USA, 2019.

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