EFFECT OF THE CHELATING AGENT ON THE STRUCTURE AND MORPHOLOGY OF THE SYNTHESIZED PEROVSKITE NANOMATERIALS

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Abstract

Perovskite with oxides structure are attractive candidates for various applications due to of their structure flexibility and outstanding physical and chemical properties [1]. $YMnO_3$ is one of the most studied materials, with hexagonal structure and space group $P6_3cm$, having a high ferroelectric transition temperature (T_C ~ 900 K) and a low anti-ferromagnetic transition temperature (T_N ~ 70 K) [2,3].

In this work were studied of the $YMnO_3$ nanopowders obtained a sol-gel process using citric acid, urea or ethylenediaminetetraacetic acid (EDTA) as chelating agents. The emphasis was on the effect of the three different chelating agents, on the morpho-structural properties, and on the phase transformations during the heat treatment. The as-prepared samples were characterized by means of techniques such as X-ray powder diffraction (XRD), SEM- EDX and carried out simultaneous differential thermal analysis and thermogravimetric analysis (DTA–TG). Nanocrystalline perovskite yttrium manganese oxide ($YMnO_3$) samples synthesized by sol – gel technique was subsequent heat treatment at 1000 °C for one hour.

The samples were characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM), X-ray energy dispersive spectroscopy (EDS) and ultraviolet-visible (UV–Vis) spectroscopy. The XRD pattern of the prepared samples confirmed the formation of a pure phase of $YMnO_3$ with hexagonal structure and space group: P63cm, according to JCPDS 25-1079. The energy-dispersive X-ray analysis (EDX) results highlight the elemental composition of the samples synthesized.

Acknowledgements

This work was supported by theExperimental Demonstrative Project 683PED / 2022. The authors thank C. Ianasi for help during thematerials characterization.

References

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