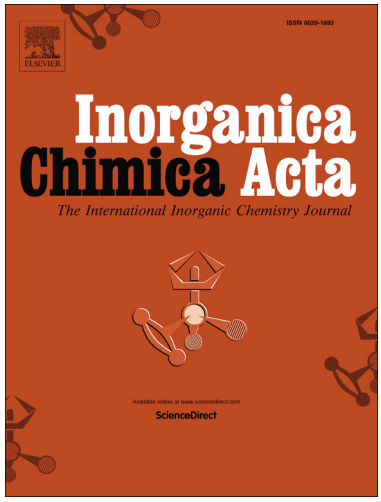

Research paper

Polymeric hybrid iodoplumbates and iodobismuthates containing mono- and bisalkylated derivatives of 1,2-bis(4-pyridyl)ethylene: structural and optical features

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Polymeric hybrid iodoplumbates and iodobismuthates containing mono- and bisalkylated derivatives of 1,2-bis(4-pyridyl)ethylene: structural and optical features

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Abstract. Reactions of PbI_2 with N-alkylated derivatives of 1,2-bis(4-pyridyl)ethylene (bpen) MeBpenI and Me_2BpenI_2 result in 1D-polymeric complexes $[\{Pb(MeBpen)I_3\}]$ (**1**) and $(Me_2bpen)[\{PbI_3\}]_2$ (**2**). For both compounds, band gap values were determinated experimentally; **1** demonstrates weak red luminescence. Binuclear hybrid iodobismuthate $[Bi_2(MeBpen)_2I_8]$ (**3**) was obtained by the similar scheme using BiI_3 instead of PbI_2.

Keywords: bismuth / lead / iodide complexes / luminescence / band gap determination / X-ray diffractometry

1. Introduction

Over the last years, halide, in particular iodide complexes of late transition and post-transition metals attract an ongoing attention of inorganic chemists [1-7]. Apart of the fundamental aspects of this area, this interest is inspired by numerous physical and chemical properties, including catalysis [5-8], thermochromism [4] [9-13], ferroelectricity etc. [14-22] An urgent and fast-growing field of application for iodometalates is design of solar cells based thereupon. The lion's share of present research is concentrated on iodoplumbates which reveal the best characteristics (PCE up to 21%) [23-27], but there are also numerous attempts to involve other metal iodides: Bi(III) [28-30], Ge(II) [31], Sb(III) [32] etc. It must be noted that although this area is developing very rapidly, the number of compounds tested in photovoltaics is still rather limited. Generally, this fact can be explained by the dominant paradigm proposing the use of cations, such as Cs^+ or methylammonium, which yield in good characteristics for iodoplumbates, but it does not guarantee desired results in the case of other metals. Therefore,