

Poster Sessions

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New oxide-ion conductors with La₂Mo₂O₉ structure

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The lanthanum molybdate La₂Mo₂O₉ (LM) attracts attention as perspective oxide-ion conductor with the conductivity 0.06 S/cm at 800°C [1]. The molybdates of such composition with other rare earths, with the exception of praseodymium Pr [2], don't exist under usual synthesis conditions; however there are tungstates with La, Pr, Nd, Sm, Eu, Gd [3]. LM has a phase transition of the order-disorder type at the temperature close to 580°C and two phases: low-temperature monoclinic α - phase and high-temperature cubic β -phase. La₂W₂O₉ (LW) has similar phase transition, but at the temperature of 1070°C [4, 5]. X-ray investigations showed that cubic LW β -phase corresponds to cubic LM β -phase [5]. The monoclinic Nd₂W₂O₉ (NW) and Pr₂W₂O₉ (PW) also have high-temperature transitions at 1255°C and 1200°C, respectively [6 - 9]. We can assume that the structure of high temperature NW and PW phases may be similar to that of LM and they may have oxide-ion conductivity.

With the aim of search of novel oxide-ion conductors with the LM structure compositions in the La₂Mo₂O₉ - Nd₂W₂O₉ - "Nd₂Mo₂O₉" (LM - NW - "NM") and La₂Mo₂O₉ - Pr₂W₂O₉ - Pr₂Mo₂O₉ (LM - PW - PM) systems were examined.

All specimens were prepared by solid state synthesis. The expansive field of the compounds with the LM-structure was discovered in the above systems. It should be noted, that in both systems the compounds with LM structure and full substitution of La for other lanthanide (Pr, Nd) are formed. Pure PM decomposes at 700 - 900°C with arising of Pr₂Mo₃O₁₂ and recombines into itself at higher temperatures (above 1000°C). An addition of 10% W or La in PM-based solid solutions leads to disappearance of this instability. Pure "NM" is a mix of Nd₂Mo₃O₁₂ and Nd₄Mo₈O₄₅. The compounds with the LM-type structure are formed in pseudo binary "NM" - NW system even at small amount of W (3 - 7%).

In the case of LM - NW - "NM" system the $\alpha \rightarrow \beta$ phase transition, which was observed in pure LM, is suppressed with addition of Nd or W and cubic phase was stabilized at room temperature in all synthesized compounds. The pure PM is monoclinic at room temperature and undergoes the $\alpha \rightarrow \beta$ phase transition at 520 - 540°C. However, mutual substitution La and Pr leads to disappearance of this transition and stabilization of cubic phase at 50 - 60% Pr. The cubic phase is also stabilizes at room temperature on addition of W similar to Nd contained system.

All synthesized compounds with LM structure show high anionic conductivity like LM (10⁻¹ - 10⁻² S/cm at 800°C). An addition of Nd and W leads to little decreasing of conductivity value. The conductivity of NW compound was no better than 10⁻⁴ S/cm at 800°C.

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Keywords: LAMOX, phase diagrams, oxide-ion conductivity

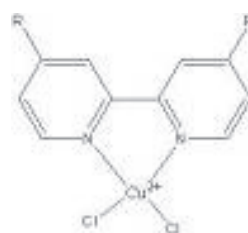
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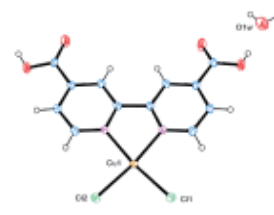
Structural and DNA binding studies of bipyridine-copper complexes

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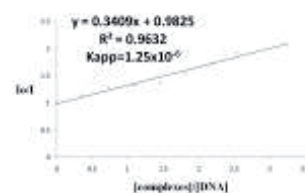
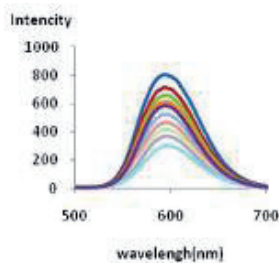
In the present, cancer is the leading cause of death. Transition metal complexes, for example cisplatin, carboplatin and oxaliplatin are an effective anticancer chemotherapy, but they have side effects and easily excreted. Therefore, substituted bipyridine-copper complexes have been developed as potential antitumor agent owing to copper metal can inhibit the cancer cell cycle. In this work, the series of substituted-bipyridine copper complexes have been intensively studied as DNA-binding anticancer agents in order to investigate the effect of substituents on the cytotoxic activity.



R = -H, -NH₂, -CH₃, -COOH, -OCH₃



Cu(COOH-bipy)Cl₂•H₂O



Emission spectra of bpy-copper complexes, Arrow show the intensity changing upon increasing bipyridine-copper concentration in displacement ethidium bromide bound to DNA and A Stern-Volmer quenching plot of the increasing amount of complexes to determine Kapp

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Keywords: bipyridine-copper complexes, structural and DNA-binding study, anticancer