

Institute of Applied Physics, R. Moldova

Dotriacontanuclear Heterometallic Compounds of Manganese Oxy-Hydroxy-Isobutyrate with Lanthanides and Process for their Preparation

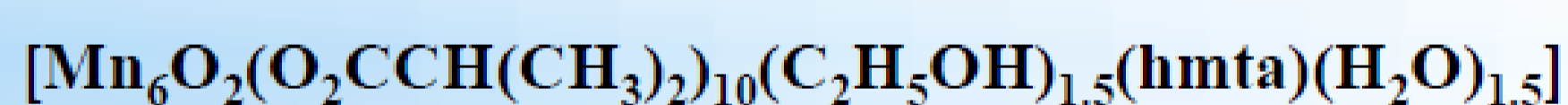
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PATENT MD 4660 C1 2020.06.30

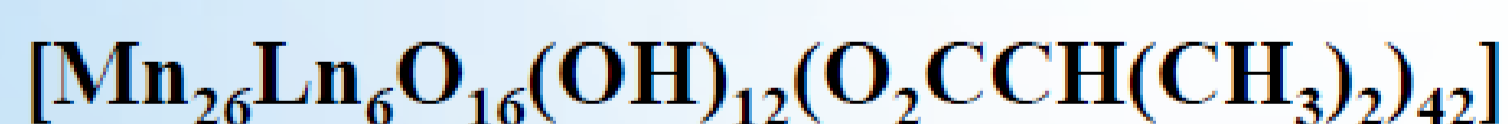
DESCRIPTION. The invention relates to coordination chemistry, in particular to the preparation of heterometallic dotriacontanuclear coordination compounds of manganese oxy-hydroxyisobutyrate with lanthanides. These compounds have been the focus of attention of researchers in recent years, due to the growing interest in potential applications in the storage and processing of information or in molecular spintronics.

According to the invention, compounds with the formula $[\text{Mn}_{26}\text{Ln}_6\text{O}_{16}(\text{OH})_{12}(\text{O}_2\text{CCH}(\text{CH}_3)_2)_{42}]$ (where Ln = Tb, Dy, Ho) can be prepared in two stages.

In the first stage, the interaction of manganese(II) isobutyrate with hexamethylenetetramine (hmta) in a mixture of acetonitrile/ethanol results in



In the second stage, interacting the obtained compound with lanthanide nitrate in the presence of 2,4,6-tris-(2-pyridyl)-s-triazine in dichloromethane/acetonitrile gives

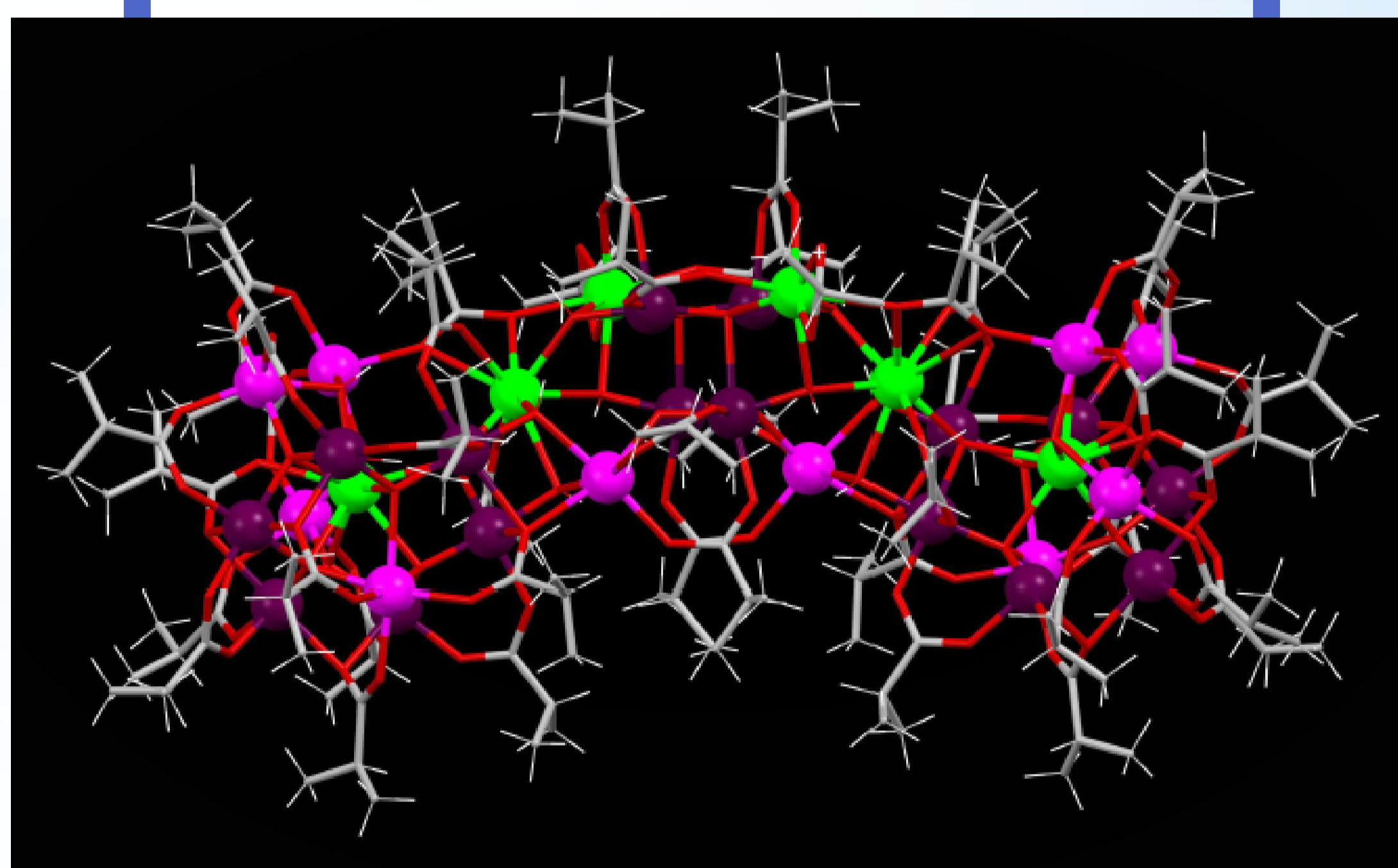


The $\{\text{Mn}_{26}\text{Ln}_6\}$ compounds are insoluble in acetonitrile, slightly soluble in dichloromethane, well soluble in alcohols, dimethylformamide, dimethylsulfoxide, chloroform.

CAS Registry Numbers:

2396609-63-3; 2396609-68-8;
2396637-93-5; 236638-26-7;
2411422-06-3; 2411422-29-0.

ADVANTAGES



 Mn(II)  Mn(III)  Ln(III)

Dy(III) ions are highlighted as green, Mn(II) ions as violet, and Mn(III) ions as purple balls.

Up to date, these compounds represent the highest-nuclearity Mn-Ln clusters that shows a single-molecule magnetic (SMM) behavior.