

LETTERS TO THE EDITOR

Synthesis and Study of Manganese Hexamolybdocobaltate

A. V. Oreshkina^a, G. Z. Kaziev^a, and T. Yu. Glazunova^b

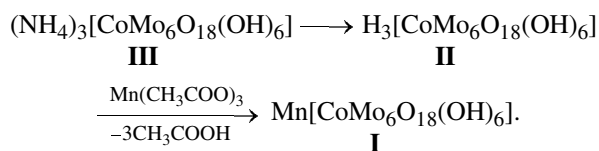
^aMoscow State Pedagogical University,
Nesvizhskii per. 3, Moscow, 119021 Russia
e-mail: nastja_or@mail.ru

^bLomonosov Moscow State University, Moscow, Russia

Received November 7, 2006

DOI: 10.1134/S1070363207030243

Previously we suggested a procedure for preparing copper hexamolybdocobaltate [1] and studied this compound by X-ray phase and structural, as well as thermogravimetric analysis. In the present work we prepared manganese hexamolybdocobaltate (**I**) of the composition $\text{Mn}[\text{CoMo}_6\text{O}_{18}(\text{OH})_6]$, which can be applied as a catalyst in organic synthesis.



Compound $\text{Mn}[\text{CoMo}_6\text{O}_{18}(\text{OH})_6]$ (**I**) was prepared by an exchange reaction between hexamolybdocobaltic acid (**II**) and manganese acetate (**III**) in water at room temperature. The mixture of the solutions was evaporated in a dessicator over KOH. After several weeks compound **I** precipitated as light violet crystals. The crystals were filtered off, washed with water and ethanol, dried, and recrystallized from water.

Hexamolybdocobaltic acid (**II**) was obtained from ammonium hexamolybdocobaltate by ion-exchange chromatography on a KU-2-8 resin (8% divinylbenzene).

Ammonium hexamolybdocobaltate (II) was synthesized by a modified procedure [2]. A hot solution of 53 g of ammonium paramolybdate in 200 ml

of water, acidified with nitric acid to pH 3, was added a solution of 25 g of cobalt nitrate in 100 ml of water, after which 25 ml of 18% hydrogen peroxide was added dropwise. The mixture was heated for 3 h on a water bath. After cooling to room temperature, compound **II** precipitated as green crystals within a day. The crystals were washed with water and recrystallized from water.

To prove individuality and purity of compound **I** and to obtain crystallographic data, its X-ray phase analysis was performed. The X-ray powder patterns were indexed using the Powder-2 program package. Retrieval from the PCPDFWIN database showed that compound **I** is individual, contains no possible admixtures, and relates to a monoclinic singony with the following unit cell parameters: a 18.6394, b 3.4220, c 17.2499 Å, β 97.280°; V 1091.39 Å³. The picnometric density of the compound, determined by the Syromyatnikov procedure is d_{exp} 3.015 g cm⁻³, number of formula units $Z = 1$.

REFERENCES

- Holguin Quinones, S., Kaziev, G.Z., Oreshkina, A.V., Zavodnik, V.E., Rodrigues Reyes, M., and Morales Sanches, L.A., *Zh. Neorg. Khim.*, 2005, vol. 50, no. 11, p. 1813.
- Nikitina, E.A., *Geteropolisoedineniya* (Heteropycompounds), Moscow: Goskhimizdat, 1962.