



ICKT

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KYIV-TOULOUSE

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“KYIV-TOULOUSE” DEDICATED TO THE 100TH
ANNIVERSARY OF FEDIR BABICHEV**

**IXth CONFERENCE INTERNATIONALE de CHIMIE
“KYIV-TOULOUSE” DÉDIÉ AU 100^{ÈME} ANNIVERSAIRE DE
FEDIR BABICHEV**

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La-CONTAINING HETEROPOLY TUNGSTATE WITH PEACOCK-WEAKLEY ANION: SYNTHESIS OF $\text{Na}_9[\text{La}(\text{W}_5\text{O}_{18})_2] \cdot n\text{H}_2\text{O}$ FROM AQUEOUS AND AQUEOUS-ORGANIC MEDIA

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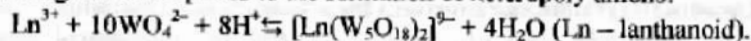
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The conditions for the synthesis of new heteropoly tungstates $\text{Na}_9[\text{La}(\text{W}_5\text{O}_{18})_2] \cdot n\text{H}_2\text{O}$ from the aqueous and H_2O -Solvent media (Solvent = acetone, CH_3CN , $\text{C}_2\text{H}_5\text{OH}$), acidified to $Z = \nu(\text{H}^+) / \nu(\text{WO}_4^{2-}) = 0.80$, were determined.

Acidity $Z = \nu(\text{H}^+) / \nu(\text{WO}_4^{2-}) = 0.80$ in the presence of stoichiometric amounts of initial reagents corresponds to the formation of heteropoly anions:



To isolate such particles with La^{3+} -heteroatoms, sodium tungstate solutions ($C_W = 0.1 \text{ mol/L}$) acidified to $Z = 0.80$ were used, to which $\text{La}(\text{NO}_3)_3$ solutions were added with vigorous stirring. After decanting of the components in a stoichiometric ratio of $\text{La}:\text{W} = 1:10$, solvents were added to the systems (up to 50 vol. %) and formation of needle-like crystalline precipitates were observed.

FTIR spectroscopy was used to show that the anion within the synthesized salts has a Peacock-Weakley structure. Nature of stretch and deformation vibrations in the tungsten-oxygen framework within FTIR spectra of air-dry samples of salts indicates to the presence of Peacock-Weakley heteropoly anion of 10th row in them. In this anion, two lacunar tetradentate pentatungstate-anions $\text{W}_5\text{O}_{18}^{6-}$ are coordinated to La -heteroatom, thus forming a coordination polyhedron in the shape of a square antiprism.

Using Scanning Electron Microscopy the surface morphology of heteropoly compounds was studied, and it was found out that the grain size is within the range of 140-300 nm (for the sample salted by acetone), 200-400 nm (for the sample salted by CH_3CN), 300-450 nm (for the sample salted by ethanol). Single-phase condition of the synthesized salts was confirmed by the surface uniform contrast in backscattered electron mode. On the micrographs of salts powder in characteristic X-ray emission there are no regions with different surface morphology, and there is an even distribution of La , Na , W , O , without segregation and cliquation. These clearly indicate to the formation of a single-phase sample.

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fullerene hybridsFokin A.A., Butova E.D., Schreiner P.R.**Nanosized tin dioxide modified BY Pt as gas sensitive material for semiconductor sensors to methane detection in air** 204G.V. Fedorenko, L.P. Oleksenko, N.P. Maksymovych, I.P. Matushko, O.P. Ripko, G.I.Skolyar**Influence of crystal structure of Eu^{3+} complexes with N-(diphenylphosphoryl)pyrazine-2-carboxamide on their photophysical properties** 205Yen H. Pham, Victor A. Trush, Vladimir M. Amirkhanov, Paula Gawryszewska**Halide and ammonia palladium-copper complexes supported on modified tripoli in the reaction of carbon monoxide oxidation** 206

T.L. Rakitskaya, K.O. Golubchik, T.A. Kiose, V.Y. Volkova

 ScCO_2 deposition of γ -alumina supported Pd nanocatalysts with new fluoros precursors and application in suzuki-miyaura reactions 207Fatma Ulusal, Eylül Büşra Hereytani, Aysen Demir, Bilgehan Güzel**Dinuclear lanthanide complexes with bis-chelating CAPH-type ligand** 208
Horniichuk O.Ye., Trush V.A., Kariaka N.S., Shishkina S.V., Amirkhanov V.M.**Adsorption of cis-dichlorodiammineplatinum by $\text{Fe}_3\text{O}_4/\text{PAA}$ nanocomposites** 209

O.M. Kaminskiy, N.V. Kusyak, P.P. Gorbyk, A.L. Petranovska, S.P. Turanska

Creation of suspensions and obtaining of ceramic tapes for fuel cells by tape casting method 210S.E. Ivanchenko, I.O. Polishko**Investigation of the structure, phase composition and electrochemical characteristics of hydrogen-sorbing intermetallics of the La-Mg-Ni system obtained by the sintering method of powders** 211Kryvitskyj A., Shcherbakova L., Gaivoronskaya K., Samelyuk A., Solonin Yu.**Chemical dissolution of Cu98Be alloy in various electrolyte solutions** 212

Larin V.I., Egorova L.M.

La-containing heteropoly tungstate with peacock-weakley anion: synthesis of $\text{Na}_9[\text{La}(\text{W}_5\text{O}_{15})_2] \cdot n\text{H}_2\text{O}$ from aqueous and aqueous-organic media 213Mariichak O.Yu., Rozantsev G.M., Radio S.V.**Synthesis and investigation of strontium-containing complex substituted phosphates** 214Oksana Livitska, Olha Livitska, Oleg Prymak, Yuriy Prylutsky**Synthesis and structure of different-ligand and different-metal germanium (IV) complexes with malic acid and 1,10'-phenanthroline** 215

Martsinko E.E., Seifullina I.I., Chebanenko E.A., Afanasenko E.V., Dyakonenko V.V., Shishkina S.V.

Electrooxidation of selenium on modified TiO_2 films 216

M. Plahotna, V. Vorobets, G. Kolbasov, N. Smirnova, O. Linnik, A. Eremenko

IR luminescence of Nd^{3+} , Sm^{3+} , AND Yb^{3+} β -diketonates in different 217