TSETLIN, M. L.; KRYLOV, V. Yu.

"Games of Automata."

report presented at the Symp on Relay Systems Theory & Finite Automata, Moscow, 24 Sep-2 Oct 62.

S/0103/64/025/005/0668/0672

ACCESSION NR: AP4036509

AUTHOR: Ginzburg, S. L. (Moscow); Kry*lov, V. Yu. (Moscow); Tsetlin, M. L. (Moscow)

TITLE: Example of a game of many identical automata

SOURCE: Avtomatika i telemekhanika, v. 25, no. 5, 1964, 668-672

TOPIC TAGS: game, automata game, game of permutation

ABSTRACT: A simple example of a symmetrical game of many automata which permits a natural interpretation is discussed. The payoff of each player is equal to the power of his strategy divided by the number of players who have chosen the same strategy; this game is termed the "game of permutation." A modification of this game includes an agreement between the players to receive a maximum total payoff and to divide it equally; only the first strategies are used, and each of them is selected by only one player; this modification is called the "game of

Card 1/2

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rd 2/2

KRYLOV, V.Yu.

Integration of analytic functionals over alternating distributions.
Dokl. AN SSSR 163 no.2:289-292 Jl '65. (MIRA 18:7)

1. Submitted December 28, 1964.

L 04905-67 EWT(d)/EWP(1) IJP(c) GD

ACC NR: AT6022685 SOURCE CODE: UR/0000/66/000/000/0165/0169

AUTHOR: Tsetlin, M. L.; Ginzburg, S. L.; Krylov, V. Yu.

38
B+1

ORG: none

TITLE: Example of the collective behavior of finite automatons

SOURCE: Moscow. Institut avtomatiki i telemekhaniki. Samoobuchayushchiyesya avtomaticheskiye sistemy (Self-instructing automatic systems). Moscow, Izd-vo Nauka, 1966, 165-169

TOPIC TAGS: finite automaton, game theory, computer simulation

ABSTRACT: The article contains a description of an example of computer simulation of an "assignment game" by many automatons. A simple example of a symmetrical game permitting a natural interpretation is selected. Resultant conditions and equilibrium points are studied, and the behavior in this game of automatons interrelated by the "common pool" procedure is studied. The authors show that automatons invested with purposeful behavior under stationary random conditions will likewise behave "reasonably" in this case as well (provided that their memory capacity is sufficient). Three strategy examples are analyzed and win factors are derived for different memories and for situations with and without the "common pool" concept.

SUB CODE: 09,12/ SUBM DATE: 02Mar66/ ORIG REF: 002/ OTH REF: 002

Card 1/1

KRYLOV, Ya.; IVERONOVA, V.I.

Plastic deformation of germanium single crystals (by insertion of a spike). Kristallografiia 6 no.5:784-786 S-O '61. (MIRA 14:10)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Deformations (Mechanics)) (Germanium crystals)

KRYLOV, Ye.I.

Universal instrument for measuring wear of parts. Sudostroenie
26 no.9:65-67 S'60. (MIRA 13:10)
(Mechanical wear) (Pistons--Testing)

SOMOV, V.A.; KRYLOV, Ye.I.

Use of the OMII-1 all-purpose indicator for measuring the wear of mechanical parts. Zav.lab. 28 no.6:744 '62. (MIRA 15:5)
(Testing machines)

KRYLOV, Yu.I.

Interference preventing capacitive filters on electric locomotives. Avtom., telem. i sviaz' 7 no.8:41-43 Ag '63. (MIRA 16:9)

1. Starshiy inzh. laboratorii signalizatsii i svyazi Severnoy dorogi.
(Electric locomotives—Electric equipment)
(Railroads—Communication systems)

[illegible], A.F., kand. tekhn. nauk; KRYLOV, Ye.[illegible].; [illegible], S.[illegible].

Effectiveness of automation in Krivoy Rog Basin mines. Met. i gornorud. prom. no.6:51-52 N-D '64. (MIRA 18:3) [illegible], G.F., kand.tekhn.nauk; KOVALEV, A.F., kand.tekhn.nauk; BELAN, A.S., inzh.; FEDOROVSKIY, V.V., inzh.; KRYLOV, Ye.G., inzh.; KULINICH, N.T., inzh.; GAPON, A.M. technik.

Railroad switching from the machinist's cabin. Gor.zhur. no.2: 62-63 F '64 (MIRA 17:4)

1. Institut avtomatiki Gosplana UkrSSR, Kiyev.

[illegible] obyazannosti starshego inzhenera; KRYLOV, Ye.I., ispolnayaushchiy obyazannosti inzhenera

Effect of lubricants on the formation of a carbon deposit in diesel engines. Inform. sbor. TSNIIMF no.47. Tekh. ekspl. mor. flota no.3:49-57 '60. (MIRA 15:1)
(Marine diesel engines--Lubrication)

SOMOV, V.A.; KHILOV, Ye.I.

Cylinder oils for slow-run high-powered diesels. Khim.i tekh.topl. i masel 6 no.1:54-57 Ja '61. (MIRA 14:1)

1. TSentral'nyy nauchno-issledovatel'skiy dizel'nyy institut. (Diesel fuels)

YEGOROV, Yu.V.; NIKOLAYEV, V.M.; KRYLOV, Ye.I.; TKACHENKO, Ye.V.

Possibility of using a mixture of isotopes of Sr^{89} and Sr^{90} Y^{90} in direct radiometry. Radiokhimia 4 no.4:516-518 '62. (MIRA 15:11)

(Strontium—Isotopes)
(Yttrium—Isotopes) (Radiometry)

YEGOROV, Yu. V.; KRYLOV, Ye. I.

Nature of absorption of electrolytes by some precipitates.
Izv. vys. ucheb. zav.; khim. i khim. tekh. 5 no.5:749-752
'62. (MIRA 16:1)

1. Ural'skiy politekhnicheskiy institut imeni S. M. Kirova,
kafedra khimii i tekhnologii redkikh elementov.

(Adsorption) (Electrolytes)

S/186/63/005/002/001/005
E075/E136

AUTHORS: Yegorov, Yu.V., and Krylov, Ye.I.

TITLE: Some peculiarities of sorption of strontium-90 on active manganese dioxide

PERIODICAL: Radiokhimiya, v.5, no.2, 1963, 211-215

TEXT: Sorption of micro-quantities of ^{90}Sr was studied on an active MnO_2 resulting from the action of H_2O_2 on $K\,MnO_4$ under conditions of free coagulation, whereby the precipitate (MnO_2) sorbed a proportion of K^+ ions and the pH of the system remained constant. The dependence of $[OH^-]$ on the mass "concentration" of the sorbent $[m_s]$ was determined acidimetrically. The following equations were obtained:

$$[m_s]_{ef} = 0.64\,[m_s]^{1.24}, \qquad (1)$$

$$[OH^-] = 0.42\,[m_s]^{1.68} \qquad (2)$$

where $[m_s]_{ef}$ - effective mass of sorbent. The quantity of ^{90}Sr removed by MnO_2 is given by:

Card 1/2

Some peculiarities of sorption of ... S/186/63/005/002/001/005
E075/E136

$$c = K_1[m_s]^{2.92} \tag{4}$$

where K_1 - constant. Eq.(4) was confirmed experimentally for a solution of K MnO_2 (0.192 to 1.15 mM/ℓ), KCℓ (8 g/ℓ) and about 10 microcuries/ℓ ^{90}Sr precipitated by H_2O_2. K_1 was found to be 164. The amount of coagulant (KCℓ) affects strongly the distribution of ^{90}Sr between MnO_2 and the solution.
There are 3 figures and 1 table.

SUBMITTED: March 26, 1962

Card 2/2

CHUPAKHIN, O.N.; PUSHKAREVA, Z.V.; KRYLOV, Ye.I.

Reactions and derivatives of quinaldine. Vest. AN Kazakh. SSR 19 no.9:85-92 S '63.
(MIRA 16:11)

NIKOLAYEV, V.M.; KRYLOV, Ye.I.; BAGRETSOV, V.F.; YEGOROV, Yu.V.

Behavior of radiocolloids of cerium in sorption systems.
Radiokhimiia 5 no.5:622-626 '63. (MIRA 17:3)

KRYLOV, Ye.I., inzh.

Detonations in engine housings. Energomashinostroenie 9 no.11:48 N '63. (MIRA 17:2)

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

2

Laminary systems. XI. Formation and properties of thin sulfur films on the surface of copper chloride solutions. S. O. Mokrushin, E. I. Krylov and G. P. Khovyakova. *Colloid. J.* (U. S. S. R.) 3, 33-44 (1937); cf. *C. A.* 31, 18°.—The film formed by H_2S on the surface of aq. $CuCl_2$ is permeable to H_2S (cf. *C. A.* 29, 7748°); its thickness increases indefinitely. It crystallises after some hrs.
B. C. A.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

CN

2

The formation and the properties of thin films of sulfur
on the surface of solutions of copper sulfate. N. O.
Mokrushin, E. I. Krylov and R. P. Khovyakova. *Trudy*
Ural. Ind. Inst. 1938, No. 6, 9-16; *Khim. Referat. Zhur.*
1, No. 11-12, 20(1938); cf. *C. A.* 33, 3445ᵉ.—The effects
of concn. of the CuSO₄ soln., of the concn. of H₂S on the
surface of a soln. of a definite concn. and of the length of
action of the gas were investigated. The exptl. methods,
methods for the detn. of the film thickness, the concn. of
gas, the washing of the films, methods of analyzing them,
etc., are described in detail. The exptl. results are tabu-
lated and plotted. The thickness of the film increases
with increase in the concn. of the soln., with increase in
the H₂S concn. and with the duration of its reaction with
the soln. When H₂S (100%) was blown through a soln.
of CuSO₄, the film was obtained in the form of a foam. The
expts. were performed in N₂ and O₂ gas in a specially con-
structed app. The foam films contain free S (together
with CuSO₄), and they differ in properties from films ob-
tained on a calm surface of the soln.; they are not so elas-
tic and are of dark colors. Films obtained on a calm sur-
face of the soln., when kept for a long time on the surface
of water (in a crystallizer) or in a dry state on a glass
plate, also lost their elasticity and were transformed
gradually into microscopic crystals of rhombic S.

W. R. Henn

ASS-SLA METALLURGICAL LITERATURE CLASSIFICATION

KRYLOV, E. I.

USSR/ Chemistry - Polarography

Card 1/1 : Pub. 22 - 22/49

Authors : Krylov, E. I.; Kolevatova, V. S.; and Samarina, V. A.

Title : Polarographic investigation of titanium and niobium sulfate solutions

Periodical : Dok. AN SSSR 98/4, 593-595, Oct. 1, 1954

Abstract : Experiments were conducted to determine the possibility of obtaining Nb and Ti waves from their sulfate solutions and to establish the basic conditions for polarographic quantitative determination of Ti and Nb during their combined presence in the solution. The results obtained indicate that during cathode reduction of Nb and Ti from their sulfate solutions, over a mercury drop cathode, certain clearly expressed waves, corresponding to ion overcharge processes, appear on the polarogram. Five references: 2-Czech; 2-USSR and 1-German (1919-1953). Table; graphs.

Institution : The S. M. Kirov Ural Polytechnicum

Presented by : Academician I. P. Bardin, March 18, 1954

982. **Polarographic determination of niobium and titanium from sulphuric acid solutions.** E. I. Krylov and V. S. Kolevatova (S.M. Kirov Ural Polytech. Inst.). *Zavod. Lab.*, 1955, **21** (8), 911-913.—Niobium in H_2SO_4 (< 80 per cent.) gives a polarographic wave with two steps. The half-wave potential for $Nb^{V} \rightarrow Nb^{III}$ is $-1{\cdot}055$ V *vs.* the S.C.E. Titanium in H_2SO_4 (< 60 per cent.) gives a wave with a half-wave potential of $-0{\cdot}574$ V. Ta does not give a wave under these conditions. To determine Ti and Nb in ores, etc., 0·5 g is decomposed in a platinum dish with H_2SO_4 and HF, the solution is evaporated to dryness, the residue is fused with 15 times its weight of $K_2S_2O_7$, and the melt is treated with 100 ml of 10 per cent. H_2SO_4 and H_2O_2. The SiO_2 is filtered off, the filtrate is treated with 60 ml of conc. H_2SO_4, and the solution is evaporated to fumes. The solution is then diluted to 70 per cent. H_2SO_4 with water, and 15 ml are taken for the polarographic determination. Gelatin is added as max. suppressor and H is passed through the solution.

G. S. Smith

Ye.

Composition and properties of the hydrochloric acid solution of niobium pentoxide. S. I. Solov'ev, B. I. Krylov, and V. F. Degtyarev. *J. Gen. Chem. U.S.S.R.* 25, 613-15 (1965)(Engl. translation).—See *C.A.* 49, 12160i.

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USSR

Composition and properties of the ~~[illegible] solution of niobium pentoxide.~~ ~~[illegible]~~ and ~~V. E. [illegible]~~. Zhur. [illegible] 25, [illegible] (1955).—Nb_2O_5 was fused with [illegible] and the [illegible] powdered and leached with concd. H_2SO_4. [illegible] to the resulting soln. pptd. [illegible] with hot H_2O until free of SO_4. Heating to boiling a mixt. of 20 g. of freshly pptd. acid with [illegible] ml. cold concd. HCl gave a suspension, which was filtered while hot through a no. 4 glass filter. The residue was promptly dissolved in 150-200 ml. H_2O, forming a clear soln. (I), which after several days became opalescent, but without formation of a ppt. Nb in I was detd. by pptn. of niobic acid either by addn. of NH_3 or by diluting 2 ml. I to 50 ml. with H_2O, and boiling several min. HCl in I was detd. acidimetrically and corroborated by titration with $AgNO_3$. The wt. ratio Nb:Cl varied from 1:3.53 to 1:4.12 depending on the conditions of formation of I. I was titrated conductometrically with NaOH, $KNaF_2$, and $K_2C_2O_4$. With each reagent there was obtained a min. in cond. corresponding to the total HCl present in I. In each case there was an inflection in the cond. curve before the min. was reached. The inflections indicated that part of the HCl was "free", while part was "bonded" to the niobic acid. The mol. ratio of the "bonded" HCl:Nb was constantly 3:1, while the relative amt. of "free" HCl varied. Thus the species in soln. is a hydrated niobium oxychloride. Donald B. Miller

Metaniobates of calcium and barium and their hydrates. E. I. Krylov and Yu. I. Alekseev. *Zhur. Obshchei Khim.* 25, 1062-7(1955); cf. *C.A.* 49, 6758c.—When $KNbO_3$ in aq. KOH soln. was mixed with equiv. amts. of $Ca(OH)_2$ (0.002 g./ml. Ca^{++}) and $Ba(OH)_2$ (0.026 g./ml. Ba^{++}) solns., the white cryst. $Ca(NbO_3)_2.2H_2O$ and $Ba(NbO_3)_2.3H_2O$ pptd. Their soly., in g./l. at 18°, and soly. product (both detd. via Nb^{-}) were, resp., 0.00625, 1.29×10^{-10}; 0.00120, 3.85×10^{-16}. Under a steady temp. rise these decompd. at 120-297° and 120-228°, resp., to give the monohydrates, which were stable up to the ranges 348-483° and 254-320°, resp., at which the finely powd. anhyd. salts were formed; the heating required 120 min. M.ps. and ds. were: $Ca(NbO_3)_2$, 1310°, 3.770; $Ba(NbO_3)_2$, 1285°, 4.040. X-ray data (Fe emission) on lattice parameters and interplanar distances are given for the anhyd. salts, and for the higher hydrates; the former are thought to have a face-centered cubical lattice of the fluorspar type, like that of $Sr(NbO_3)_2$ as illustrated, while the latter have a similar structure except for the H_2O in its spaces. Calcns. of d. from x-ray data agreed with the exptl. d. Also in *J. Gen. Chem. U.S.S.R.* **25**, 1013-16(1955) (Engl. translation).

Malcolm Anderson

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KRYLOV, Ye.I.; SHARNIN, A.A.

Synthesis and properties of niobium bronzes. Zhur.ob.khim. 25
no.9:1680-1685 S '55. (MLRA 9:2)

1.Ural'skiy politekhnicheskiy institut.
(Niobates)

KRYLOV, Ye.I.

Synthesis and properties of yttrium orthotitanate. Zhur.neorg. khim. 1 no.3:366-367 Mr '56. (MLRA 9:10)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova.
(Yttrium titanate)

KRYLOV Ye. I.

USSR/Inorganic Chemistry - Complex Compounds, C

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 659

Author: Podchaynova, V. N., Krylov, Ye. I., and Ryabchikov, D. I.

Institution: ~~None~~ Ural Polytech Inst.

Title: On the Valency of Copper in Some Complex Compounds

Original Periodical: Zh. neorgan. khimii, 1956, Vol 1, No 3, 406-411

Abstract: The magnetic susceptibility of a number of Cu complexes has been measured at 18° with a view toward establishing the valency of Cu in these complexes. Cu "ditizonat" [Tr. note: diphenyldithiocarbazonate ?] and the thiocyanate of Cu-n-anisidinate obtained by treating a dilute $CuSO_4$ solution with an excess of p-anisidine [methoxyaniline] (I) and KCNS are diamagnetic (the composition of neither compound has been established), which indicates that they contain Cu. The following complexes are paramagnetic (the numbers in parentheses give the values of μ(eff) in μ_B calculated from Curie's law): Cu p-anisidinate sulfate obtained by treating a dilute $CuSO_4$ solution with an

Card

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Krylov, Ye. I.

Category: USSR

Abs Jour: RZh--Kh, No 3, 1957, 7755

Author : Solov'yev, S. I., Krylov, Ye. I., and Kononova, L. P.
Inst : Not given
Title : Purification of Niobium from Titanium by Means of Cation-Exchange Resins

Orig Pub: Zh. Neorgan. Khimii, 1956, Vol 1, No 4, 660-663

Abstract: The separation method is based on the ability of freshly precipitated niobic acid to form a colloidal suspension of niobium oxychloride after treatment with concentrated HCl; the oxychloride is not adsorbed on the cation-exchange resins, whereas Ti and other impurities present in the form of cations are adsorbed. Three grades of cation-exchange resins were used in the acid form: Espatit-1, Espatit-A, and Sulfougol-K. Some adsorption of Nb was observed on each of the above cation-exchange resins (Sulfougol-K showing the least adsorption). At HCl concentrations of 0.1-0,2N, the Nb is retained in the eluent while

Card : 1/2

Category: USSR

Abs Jour: RZh--Kh, No 3, 1957, 7755

the Ti is 90% adsorbed even when present in considerable amounts; however, the less Ti is present in solution, the more complete is the adsorption. By repeated recycling of the solution niobium of purity in excess of 99.9% can be prepared. The adsorbed Ti is recovered by elution with 2N HCl or a 5% solution of oxalic acid; in the latter case small amounts of Nb adsorbed by a mechanism different from that of ion exchange (surface adsorption) are also recovered.

Card : 2/2

USSR/Inorganic Chemistry - Complex Compounds, C

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 653

Author: Alekseyev, Yu. I., and Krylov, Ye. I. [redacted]

Institution: None

Title: Hydrides of the Transition Elements. 1. Synthesis and Properties of Niobium Hydrides

Original Periodical: Ukr. khim. zh., 1956, Vol 22, No 2, 143-145

Abstract: $NbCl_5$ reacts very rapidly with a 0.3 M C_6H_5MgBr in ether, forming, in the opinion of the authors, a cinnamon-colored residue of Nb. The highly dispersed Nb thus produced can combine easily with hydrogen, and the hydride separates out in the form of a sticky, dark, cinnamon-colored liquid. Upon washing with ether and drying at room temperature in a stream of H_2, this liquid changes to a black amorphous Nb hydride (I). After treatment with C_6H_5Br, I again turns liquid. I is oxidized in air with the formation of niobic acid. Concentrated HNO_3 oxidizes I to niobic acid and NO_2. The action of HCl on I results in

Card 1/2

USSR/Inorganic Chemistry - Complex Compounds, C

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 653

Abstract: the evolution of H_2 and the formation of a yellow-green solution. The reaction of I with H_2SO_4 likewise liberates H_2, but the resulting solution shows the brick-red color characteristic of the sulfate complexes of lower-valence Nb. The composition of I, depending on the length of the action of H_2, corresponds to the formulas NbH or NbH_2. The authors explain a somewhat higher H_2 content in I than that calculated from these formulas by the absorption of H_2 by the hydrides with the formation of solid solutions.

Card 2/2

KRYLOV, Ye. I.

USSR/ Physical Chemistry - Electrochemistry B-12

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 11362

Author : Krylov Ye.I., Kolevatova V.S.

Title : Concerning Electrolytic Reduction of Niobium in Solutions of Its Sulfate

Orig Pub : Zh. prikl. khimii, 1956, 29, No 8, 1292-1295

Abstract : Study of the influence current density i, temperature and composition of electrolyte, on yield, on basis of current consumption (YC), in the electrolysis of solutions of Nb(5+) (RZhKhim, 1955, 25890). YC is considerably higher with Pb than with Hg. On increase of i, on lowering of temperature and of Nb(5+)-concentration, YC drops. On increase of H_2SO_4 content YC increases only slightly. The results obtained are attributed to the influence of the factors under study on the diffusion rate of Nb(5+) to the cathode.

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KRYLOV, Ye. I

PUZAKO, V.D.; KRYLOV, Ye.I.; SHTOL'TS, A.K.

The nature of indium dichloride. Zhur. neorg. khim. 2 no.8:1753-1756 Ag '57. (MIRA 11:3)

1. Ural'skiy politekhnicheskiy institut.
(Indium chloride--Magnetic properties)

KRYLOV, Ye.I.; CHUKHLANTSEV, V.G.; CHUNIN, V.S.

Studying solubility in the system tantalum pentoxide - selenic acid-water. Izv.vys. ucheb. zav.; tsvet. met. no.3:97-101 '58.
(MIRA 11:11)

1. Ural'skiy politekhnicheskiy institut. Kafedra khimii i tekhnologii redkikh metallov.
(Systems (Chemistry)) (Solubility)

AUTHOR: Krylov, Ya. I. SOV/156-58-4-16/49

TITLE: On Polynuclear Chlorides of Niobium and Tantalum (O mnogoyadernykh khloridakh niobiya i tantala)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 4, pp 676-679 (USSR)

ABSTRACT: By the method of magnetochemistry the valence state of the atoms of niobium (tantalum) in the polynuclear compounds $Nb_6Cl_{14}\cdot7H_2O$ and $Ta_6Cl_{14}\cdot7H_2O$ was investigated. The syntheses of the initial products were carried out by the reduction of $NbCl_5$ ($TaCl_5$) with Na-amalgam in evacuated little tubes of molybdenum glass at 400°C. The analyses of the products synthesized correspond to the above-mentioned formula. The measurement of magnetic susceptibility was carried out by Gouy's method at 78°, 206°, 273° and 293°K. The polynuclear chlorides of niobium and tantalum are paramagnetic. It was found that within the temperature range of 78-293°K the magnetic susceptibility of these compounds obey the Curie-Weiss law, with negative values for the constant Θ. In the molecules $Nb_6Cl_{14}\cdot7H_2O$

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On the Polynuclear Chlorides of Niobium and Tantalum SOV/156-58-4-16/49

and $Ta_6Cl_{14}.7H_2O$ Me-Me atom bonds are present. It is shown that in the composition of the molecules of polynuclear compounds of niobium and tantalum two positive paramagnetic ions Nb^+ (Ta^+) and 4 diamagnetic atoms Nb(Ta) are present. There are 1 figure, 1 table, and 11 references, 3 of which are Soviet.

ASSOCIATION: Kafedra khimii redkikh elementov Ural'skogo politekhnicheskogo instituta im. S. M. Kirova (Chair of Rare Elements Chemistry at the Ural Polytechnic Institute imeni S. M. Kirov)

SUBMITTED: April 7, 1958

Card 2/2

AUTHOR: Krylov, Ye.I. SOV/78-3-7-4/44

TITLE: I. The Magnetic Properties of the Oxides and Sulfides of Niobium and Tantalum in Their Lowest Valence Stage (I. Magnitnyye svoystva okislov i sul'fidov niobiya i tantala nizshikh valentnostey)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 7, pp 1487-1489 (USSR)

ABSTRACT: The susceptibility of NbO_2, NbS_2, TaO_2 and TaS_2 was measured at different temperatures.

For the determination of the susceptibility of the above mentioned compounds the integral method developed by Curie was employed. Investigations were carried out at temperatures of 90, 206 and 239°K. The dependence of susceptibility on temperature is determined for the investigated components by the Curie-Weiss law.

Investigations showed that the weak paramagnetism of NbO_2, NbS_2, TaO_2 and TaS_2 is due to the presence of atomic linkages $(Me^{4+}-Me^{4+})$ in the crystal lattice. There are 3 tables and 8 references, 3 of which are Soviet.

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I. The Magnetic Properties of the Oxides and Sulfides of Niobium and Tantalum in Their Lowest Valence Stage SOV/78-3-7-4/44

ASSOCIATION: Ural'skiy politekhnicheskiy institut im. S.M.Kirova (Ural Polytechnic Institute imeni S.M.Kirov)

SUBMITTED: June 26, 1957

1. Niobium oxides--Magnetic properties 2. Niobium sulfides --Magnetic properties 3. Tantalum oxides--Magnetic properties 4. Tantalum sulfides--Magnetic properties 5. Crystals--Lattices

Card 2/2

AUTHORS: Krylov, Ye. I., Anan'ina, A. M. SOV/78-3-8-7/48

TITLE: Synthesis and Properties of Tantalum Hydrides (Sintez i svoystva gidridov tantala)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol. 3, Nr 8, pp. 1727-1730 (USSR)

ABSTRACT: The present paper gives an account of the study of the conditions for the production of tantalum hydride. The reduction process of $TaCl_5$ by means of the Grignard (Grin'yar) reagent in hydrogen and nitrogen atmosphere was investigated. For the analysis of the resulting hydrides a special method was suggested. The following compounds were found: TaH, TaH_3 and TaH_2 as well as solid solutions of tantalum with hydrogen. The chemical properties of the hydrides of tantalum produced are the same as those of the niobium hydrides.
There are 2 tables and 7 references, 2 of which are Soviet.

Card 1/2

Synthesis and Properties of Tantalum Hydrides SOV/78-3-9-2/48

ASSOCIATION: Ural'skiy politekhnicheskiy institut im. S.M.Kirova; Kafedra khimii redkikh elementov (Polytechnical Institute imeni S.M. Kirov - Ural; Chair of Chemistry of Rare Elements)

SUBMITTED: July 21, 1957

Card 2/2

AUTHORS: Solov'yev, S. I., Krylov, Ye. I. SOV/78-3-11-11/23

TITLE: On the Nature of the Hydrochloric Acid Solutions of Pentavalent Niobium (O prirode solyanokislykh rastvorov pyativalentnogo niobiya)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1958, Vol 3, Nr 11, pp 2487 - 2490 (USSR)

ABSTRACT: The behaviour of niobium hydroxide in hydrochloric acid solutions was investigated by means of the dialysis and the determination of the electric conductivity and the viscosity. A colloidal solution of niobium hydroxide with 99,8% Nb_2O_5 + 0,2% TiO_2 was used as initial material.

The results of the dialysis and the electric conductivity showed that the stability of niobium does not depend on the duration of the dialysis, but on the presence of the electrolyte in the solution. Ultramicroscopic investigations showed that the Braun movement occurs in the solution after the dialysis. In the dialysis process the niobium oxychloride is slowly transformed in niobic

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acid gel. The niobic acid gel is not reversible and has tyxotropic properties. If the gel is stored for several months it ages. The electric charge of the niobic acid sol was determined as well as the corresponding electrokinetic potential. A slow transformation of $NbOCl_3$ takes place over the mycelium of niobium oxychloride to the mycelium of the niobic acid during the dialysis process. The niobic acid has a positive charge. There are 3 tables and 9 references, 5 of which are Soviet.

ASSOCIATION: Ural'skiy politekhnicheskiy institut im.S.M.Kirova (Ural Polytechnical Institute imeni S.M.Kirov)

SUBMITTED: September 5, 1957

KALUGINA, N.N.; KRYLOV, Ye.I.

Ammonium sulfate-niobiate. Izv.vys.ucheb.zav.; khim.i khim.tekh.
2 no.5:657-661 '59. (MIRA 13:8)

1. Ural'skiy politekhnocheskiy institut, kafedra khimii i
tekhnologii redkikh metallov.
(Niobium compounds)

5(4) SOV/78-4-2-34/40

AUTHORS: Chukhlantsev, V. G., Krylov, Ye. I., Chunin, V. S.

TITLE: Investigation of the System Selenic Acid - Niobium Pentoxide - Water by the Solubility Method (Issledovaniye sistemy selenovaya kislota - pyatiokis' niobiya - voda metodom rastvorimosti)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 2, pp 478-482 (USSR)

ABSTRACT: The solubility of niobium pentoxide in solutions of selenic acid of various concentrations was investigated at temperatures of 25, 50, 75, and 100°C. Purest Nb_2O_5 (99.97%) and selenic acid (99.8%) were used as initial materials. The results show that the solubility of Nb_2O_5 rises with the increase of the concentration of H_2SeO_4. Upon doubling the concentration of selenic acid the solubility of Nb_2O_5 is increased 29 times at 25° and 120 times at 100°. In the system Nb_2O_5-SeO_3-H_2O the solid phase in the concentration range of 14-33 N H_2SeO_4 consists of variously hydrated niobium pentoxide only. This

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SOV/78-4-2-34/40

Investigation of the System Selenic Acid - Niobium Pentoxide - Water by the Solubility Method

fact was proved by means of the radioactive indicator Co^{60}. The roentgenograms of the solid phases confirm the amorphous character of hydrated niobium pentoxide. Niobium pentoxide gel is hydrated in a 60% selenic acid solution while a hydrate is formed with a composition similar to that of ortho-niobic acid: $H_3NbO_4 \cdot 0.5H_2O$. Upon a further concentration increase of selenic acid this hydrate is dehydrated. There are 1 figure, 3 tables, and 16 references, 7 of which are Soviet.

ASSOCIATION: Ural'skiy politekhnicheskiy institut im. S. M. Kirova (Ural Polytechnic Institute imeni S. M. Kirov)

SUBMITTED: December 3, 1957

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5(2),5(4)

05859

SOV/78-4-11-12/50

AUTHORS: Krylov, Ye.I., Kalugina, N.N.

TITLE: The Magnetic Properties of the Salt $K_8[Nb_6O_3(SO_4)_{12}] \cdot 21H_2O$

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 11, pp 2476-2479 (USSR)

ABSTRACT: The difficultly soluble salt $K_8[Nb_6O_3(SO_4)_{12}] \cdot 21H_2O$ is deposited in electrolytic niobium reduction in sulphuric acid solution by the addition of potassium sulphate. Various views have been uttered on the valency of Nb in this compound (Refs 1,2). In order to solve this problem, which is important for the purification of Nb from Ta, the magnetic susceptibility of this salt was determined by Gyui's method. A table shows that the salt follows the Curie-Weiss law within the temperature range 78-292°K. The constant θ° of the molecular field is -204°K. Accordingly, the salt must contain an Nb-Nb bond. It results from the stereochemical equivalence of all Nb atoms of the compound that every Nb atom is linked with two SO_4^{2-} groups and one oxygen atom. On account of the structure of the electron sheath of Nb it

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The Magnetic Properties of the Salt
$K_8[Nb_6O\cdot(SO_4)_{12}]\cdot 21H_2O$

05859
SOV/78-4-11-12/50

was found that four niobium atoms absorb two unpaired electrons each and are diamagnetic, whereas the two Nb atoms left contain one unpaired electron each and are paramagnetic with an effective magnetic moment = 1.4μ_B. Four Nb atoms are trivalent, two Nb atoms are tetravalent, which is in agreement with the experimental average oxidation level of +3.67. Consequently, the complex salt contains no Nb^{5+}, which explains the possibility of separating Nb from Ta^{5+} which is not reduced by electrolysis in sulphuric acid solution. There are 1 table and 8 references, 4 of which are Soviet.

ASSOCIATION: Ural'skiy politekhnicheskiy institut im.S.M.Kirova (Ural Polytechnic Institute imeni S.M. Kirov)

SUBMITTED: August 1, 1958

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KRYLOV, Ye. I., Doc Chem Sci (diss) -- "Investigation of the low-valence compounds of columbium and tantalum". Sverdlovsk, 1960. 21 pp (Min Higher and Inter Spec Educ RSFSR, Ural Polytech Inst im S. M Kirov), 150 copies (KL, No 14, 1960, 127)

KRYLOV, Ye.I.; PATSUK, V.V.; PODCHAYNOVA, V.N.

Structure of sulfur nitride. Izv.vys.ucheb.zav.; khim.i khim tekh. 3 no.1:41-44 '60. (MIRA 13:6)

1. Kafedra khimii i tekhnologii redkikh elementov Ural'skogo politekhnicheskogo instituta imeni S.M.Kirova.
(Sulfur nitride)

S/153/60/003/02/02/034
B011/B003

5.2600

AUTHOR: Krylov, Ye. I.

TITLE: On the Structure of the Phosphorus Sesquisulfide

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1960, Vol. 3, No. 2, pp. 223 - 225

TEXT: The author examined the structure of P_4S_3 in the molten state by the aid of the parachor method (Ref. 8) and determined the correspondence between the structure of the molecule and its chemical properties. He describes the synthesis of P_4S_3 from red phosphorus and sulfur (100:62). From the mixture of phosphorus sulfides thus formed P_4S_3 was extracted with nondehydrated benzene in the Soxhlet apparatus and was crystallized. Apparently the application of nondehydrated benzene favored the hydrolysis of higher phosphorus sulfides. The second extraction was made with benzene dehydrated with P_2O_5. The absolutely pure P_4S_3 was dried in CO_2. It had a melting temperature of 172.2°. Its density was determined to be 1.7935 g/cm^3. The parachor value of the

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On the Structure of the Phosphorus Sesquisulfide

S/153/60/003/02/02/034
B011/B003

P_4S_3 was determined according to the modified method by P. A. Rebinder (Ref. 9). First, $\sigma = 22.86$ erg/cm^2 was obtained at 172.2°C (surface tension of the molten P_4S_3). From the experimental data it was found that parachor $P = 329.8$. The parachor value 377.8 for the structure by W. D. Treadwell and Ch. Beeli (Ref. 2) strongly deviates from that obtained in the article under consideration. Besides, not all phosphorus and sulfur atoms in this structure are equivalent with respect to valency. For these and some other reasons the author rejects this structure. The parachor value obtained by the author is in better agreement with that calculated for the structure by O. Hassel and A. Pettersen (Ref. 4) (Fig. p. 224). Hence it follows from the existence of simple covalent bonds, why P_4S_3 has the lowest melting temperature in the whole series of phosphorus sulfides. For the very same reason P_4S_3 is just as soluble in carbon bisulfide as colorless phosphorus. Furthermore, acids do not affect the P_4-molecule. Since the atoms are similarly arranged in P_4S_3 the author expects that the acids will not decompose this molecule either. This assumption was confirmed by experiment. The P_4S_3-molecule is able to add 4 sulfur atoms, thus forming P_4S_7. This fact is explained

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On the Structure of the Phosphorus Sesquisulfide

S/153/60/003/02/02/034
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by the author to the effect that each phosphorus atom in the P_4S_3 - molecule has an undivided electron pair, which effects the linkage of phosphorus to sulfur by means of coordinative bonds. Thus, the structure of the P_4S_3 obtained is in close agreement with the chemical properties of its molecule. This structure follows from the tetrahedral model of the colorless phosphorus. There are 1 figure, 1 table, and 10 references, 4 of which are Soviet.

ASSOCIATION: Ural'skiy politekhnicheskiy institut im. S. M. Kirova; Kafedra khimii redkikh elementov (Ural Polytechnic Institute imeni S. M. Kirov; Chair of Chemistry of Rare Elements)

SUBMITTED: July 14, 1958

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5.3600

78209
SOV/79-30-3-23/69

AUTHORS: Yermakova, M. I., Krylov, Ye. I., Postovskiy, I. Ya.

TITLE: Structure of Formazans. Study of the Magnetic Susceptibility of Complex Compounds of Copper, Cobalt, and Nickel With Formazans

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 3, pp 849-854 (USSR)

ABSTRACT: Complexes of Cu, Co, and Ni were prepared with the following formazans: 1,3,5-triphenylformazan, 1-p-tolyl-3,5-diphenylformazan, 1-p-chlorophenyl-3,5-diphenylformazan, and 1-o-carboxyphenyl-3,5-diphenylformazan. The physical constants of the prepared complexes are shown in Table 1.

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Structure of Formazans. Study of the Magnetic Susceptibility of Complex Compounds of Copper, Cobalt, and Nickel With Formazans

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SOV/79-30-3-23/69

Table 1. Key: (1) Complex compounds of formazans; (I) (Bis-1,3,5-triphenylformazyl)-copper; (II) [Bis-(1-p-tolyl-3,5-diphenylformazyl)]-copper; (III) [Bis-(1-p-chlorophenyl-3,5-diphenylformazyl)]-copper; (IV) 1-o-Carboxyphenyl-3,5-diphenylformazyl-copper; (V) [(Bis-1,3,5-triphenylformazyl)] -cobalt; (VI) [Bis-(1-p-tolyl-3,5-diphenylformazyl)] -cobalt; (VII) [Bis-(1-p-chlorophenyl-3,5-diphenylformazyl)] -cobalt; (VIII) (Bis-1,3,5-triphenylformazyl)-nickel; (IX) [Bis-(1-p-tolyl-3,5-diphenylformazyl)] -nickel; (X) [Bis-(1-p-chlorophenyl-3,5-diphenylformazyl)] -nickel; (XI) (1-o-Carboxyphenyl-3,5-diphenylformazyl)-nickel; (2) Empirical formula; (3) Mp; (4) Found; (5) Literature; (6) Nitrogen content (%); (7) Found; (8) Calculated; (9) Metal content (%); (10) Found; (11) Calculated.

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Table 1

1

	2	3		6		9	
		4	5	7	8	10	11
I	$C_{38}H_{30}N_8Cu$	159 – 160°	158°	17.15	16.92	9.21	9.59
II	$C_{40}H_{34}N_8Cu$	158 – 159	156	16.01	16.24	9.35	9.20
III	$C_{38}H_{28}N_8Cl_2Cu$	166 – 168	—	15.38	15.33	8.50	8,69
IV	$C_{20}H_{14}O_2N_4Cu$	231 decomp.	228 decomp.	13.60	13.80	15.47	15.65

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(Table 1 continued)

V	$C_{38}H_{30}N_8Co$	227—228	228—230	17.28	17.04	9.11	8.96
VI	$C_{40}H_{34}N_8Co$	236—237	238	16.37	16.35	8.61	8.59
VII	$C_{38}H_{28}N_8Cl_2Co$	184—185	—	15.19	15.44	8.03	8.11
VIII	$C_{38}H_{30}N_8Ni$	306 decomp.	300 decomp.	17.50	17.05	8.77	8.93
IX	$C_{40}H_{34}N_8Ni$	293 decomp.	287 decomp.	16.42	16.35	8.42	8.56
X	$C_{38}H_{28}N_8Cl_2Ni$	288 decomp.	—	15.12	15.44	7.85	8.08
XI	$C_{20}H_{14}O_2N_4Ni$	275 decomp.	270 decomp.	14.37	13.97	14.82	14.64

Table 2 shows the magnetic susceptibility of the prepared compounds.

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Structure of Formazans. Study of the Magnetic Susceptibility of Complex Compounds of Copper, Cobalt, and Nickel With Formazans

76869
SOV/79-30-3-23/69

Table 2. Key: (1) Magnetic susceptibility of complex compounds of formazan with copper, cobalt, and nickel (at the intensity of magnetic field 2260 oersted); (2) Temperature, °K; (3) μ Effect (in Bor's magnetones). (1) (Bis-1,3,5-triphenylformazyl)-copper; (II) [Bis-(1-p-tolyl-3,5-diphenylformazyl)] -copper; (III) [Bis-(1-p-chlorophenyl-3,5-diphenylformazyl)] -copper; (IV) 1-o-Carboxyphenyl-3,5-diphenylformazyl-copper; (V) (Bis-1,3,5-triphenylformazyl)-cobalt; (VI) [Bis-(1-p-tolyl-3,5-diphenylfromazyl)] -cobalt; (VII) [Bis-(1-p-chlorophenyl-3,5-diphenylformazyl)] -cobalt; (VIII) (Bis-1,3,5-triphenylformazyl)-nickel; (IX) [Bis-(1-p-tolyl-3,5-diphenylformazyl)] -nickel; (X) [Bis-(1-p-chlorophenyl-3,5-diphenylformazyl)] -nickel; (XI) (1-o-Carboxy-3,5-diphenylformazyl) -nickel.

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Structure of Formazans. Study of the Magnetic Susceptibility of Complex Compounds of Copper, Cobalt, and Nickel With Formazans

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SOV/79-30-3-23/69

Table 2

1

	2	$\chi_g \cdot 10^6$	$\chi_M \cdot 10^6$	θ° K	3
I	293	1.55	1381	+5	1.81
	196	2.79	2197		
	77	8,00	5652		
II	291	1.62	1494	+4	1.87
	196	2.80	2303		
	77	8.01	5000		
III	293	2.14	1900	−10	2.08
	196	3.35	2822		
	77	8.56	6637		
IV	291	3.37	1557	+4	1.90
	196	5.22	2303		
	77	14.60	6116		
V	291	1.86	1572	0	1.93
	196	3,07	2365		
	77	8.58	5993		

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Structure of Formazans. Study of the Magnetic Susceptibility of Complex Compounds of Copper, Cobalt, and Nickel With Formazans

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SOV/79-30-3-23/69

(Table [illegible] continued)

VI	291	2.08	[illegible]	0	2.05
	195	[illegible]	2047		
	77	[illegible]	6773		
VII	291	[illegible]	[illegible]	0	2.12
	195	[illegible]	[illegible]		
	77	[illegible]	[illegible]		
VIII	291	[illegible]	[illegible]		
IX	291	[illegible]	[illegible]		
X	291	[illegible]	[illegible]		
XI	291	[illegible]	[illegible]		

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Structure of Formazans. Study of the
Magnetic Susceptibility of Complex
Compounds of Copper, Cobalt, and Nickel
With Formazans

78269
SOV/79-30-3-23/69

The measurements of the magnetic susceptibility of the obtained complexes indicate the planar position of the formazyl group structure. There are 2 tables; 2 figures; and 13 references; 3 U.K., 3 German, 2 U.S., 2 Austrian, 1 French, 2 Soviet. The 5 U.S. and U.K. references are: Nineham, A. W., Chem. Revs., 355 (1955); Hunter L., Roberts, C. B., J. Chem. Soc., 822 (1941); Figgis, B. N., Nyholm, R. S., J. Chem. Soc., 12 (1954); Kondo M., Kubo M., J. Phys. Chem., 62, 468 (1958); Bhatnagar, S. S., Khana, M. L., Nevgi, M. B., Philosoph. Mag., 25, 234 (1938).

ASSOCIATION: Institute of Chemistry of the Ural Branch of the Academy of Sciences of the USSR (Institut khimii Ural'skogo filiala Akademii nauk SSSR)

SUBMITTED: March 18, 1959

Card 8/8

33183

S/186/61/003/006/002/010
E040/E185

21.4200

AUTHORS: Yegorov, Yu.V., Krylov, Ye.I., and Tkachenko, Ye.V.

TITLE: Contribution to the theory of the distribution of micro-quantities of radioactive strontium between hydrated oxides and the solution

PERIODICAL: Radiokhimiya, v.3, no.6, 1961, 654-661

TEXT: In spite of the considerable scientific and technical importance of the processes of radioisotope adsorption on metal hydroxide, the mechanism of the process is still far from being elucidated, especially at micro-concentrations of radioisotopes, and no unified ideas have so far been formulated for the co-precipitation of radioisotopes with the hydrates. These problems are analysed theoretically and a series of equations is derived for the absorption of micro-quantities of the cations of radioisotopes (which do not form radiocolloids) by the precipitates of metal hydroxides capable of behaving as cationites in acid media. The following assumptions were made in the derivation of the equations: 1) the hydrated oxides have ion-exchange properties and, under certain definite conditions, behave as a cationite in

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33183

Contribution to the theory of S/186/61/003/006/002/010
E040/E185

acid medium; 2) the law of active mass is applicable to the system; and 3) the radioactive isotope behaves as an electrolyte at infinite dilution. The equations were checked by plotting experimental data obtained for the absorption of radioactive strontium (Sr^{90}) by ferric hydroxide and active MnO_2 as a function of the pH of the medium. The S-shaped curves obtained represent a general function of the type $y = C + mpH$ and thereby confirm the correctness of the assumptions made, especially with regard to the ion-exchange character of the sorption of strontium by metallic hydroxides. I.Ye. Starik, A.I. Novikov, L.G. Kuz'mina and Yu.V. Morachevskiy are mentioned in the article in connection with their contributions in this field. There are 3 figures and 22 references: 12 Soviet-bloc, 1 Russian translation from non-Soviet-bloc publication, and 9 non-Soviet-bloc. The four most recent English language references read as follows:

Ref.3: M.H. Kurbatov, G.B. Wood, J.D. Kurbatov.
J. Chem. Phys., v.19, 2, 258 (1951).

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X

33183

Contribution to the theory of ... S/186/61/003/006/002/010
E040/E185

Ref.4: M.H. Kurbatov, G.B. Wood, J.D. Kurbatov.
J. Phys. a. Coll. Chem., v.55, 7, 1170 (1951).
Ref.5: M.H. Kurbatov, G.B. Wood,
J. Phys. Chem., v.56, 6, 698 (1952).
Ref.16: A. Kozawa, J. Electrochem. Soc., v.106, 7, 552 (1959).

SUBMITTED: October 31, 1960

Card 3/3

X

35168
S/153/61/004/006/001/008
E021/E453

18.1200

AUTHOR: Krylov, Ye.I.

TITLE: Niobium bronzes of the alkaline and alkaline-earth metals

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, v.4, no.6, 1961, 889-891

TEXT: New niobium compounds of varying composition (niobium "bronzes") were synthesized for the first time, having the general formula $Me_{2x}NbO_{2+x}$, where Me = Na or K and x may vary from 0.45 to 0.66. They were produced by the reaction between NbO_2 and sodium or potassium carbonate in an electric furnace, connected to a vacuum pump, to remove the carbon dioxide produced during the reaction. Niobium bronzes of sodium were obtained in the form of crystals with a red-yellow colour. The pyknometric density in toluol at 20°C was 4.82 to 4.91 g/cm^3. Niobium bronzes of potassium were bright grey with a bluish tint and their densities varied from 5.41 to 5.56 g/cm^3. Niobium

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S/153/61/004/006/001/008
E021/E453

Niobium bronzes of the alkaline ...

bronzes of lithium were prepared by heating NbO_2 and Li_2O at 1250°C in a vacuum electric furnace. The resulting compound corresponded to the formula $Li_{1.1}NbO_{2.55}$. It was a grey crystalline material with a metallic lustre and had a density of 4.3 g/cm^3. Niobium bronzes of calcium, strontium and barium were prepared by heating equimolecular quantities of niobium dioxide and the alkaline-earth oxide at 1200°C. The compositions produced were $Ca_{0.9}NbO_3$ (blue-violet colour, lattice parameter 3.905), $Sr_{0.93}NbO_3$ (copper-red, parameter 4.015) and $Ba_{0.75}NbO_3$ (red-violet, parameter 4.08). The magnetic susceptibility of the niobium bronzes was measured in a magnetic field of 4000 oersteds at different temperatures. There was little change in susceptibility with change in temperature. Table 3 gives the magnetic susceptibility of the niobium bronzes and that of the corresponding metal. It can be seen from the figures that the ion Nb^{4+} is not the source of paramagnetism in niobium bronzes. The data agree with the hypothesis that niobium bronzes are solid solutions in which there is some kind of equilibrium between cations and anions containing tetravalent niobium.

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Niobium bronzes of the alkaline ... S/153/61/004/006/001/008
E021/E453

There are 3 tables.

ASSOCIATION: Ural'skiy politekhnicheskiy institut im. S.M.Kirova Kafedra khimii i tekhnologii redkikh elementov (Ural Polytechnical Institute imeni S.M.Kirov Department of Chemistry and Technology of Rare Elements)

SUBMITTED: January 29, 1960

Card 3/4

S/078/61/006/001/016/019
B017/B054

AUTHORS: Krylov, Ye. I., Strelina, M. M.

TITLE: Praseodymium- and Neodymium Orthotantalates

PERIODICAL: Zhurnal neorganicheskoy khimii, 1961, Vol. 6, No. 1, pp. 235 - 236

TEXT: The authors studied the synthesis of praseodymium- and neodymium orthotantalates and the magnetic properties of these compounds. Chemically pure oxides of tantalum, praseodymium, and neodymium were used for the synthesis of orthotantalates. Equimolar mixtures of tantalum anhydride and praseodymium oxide, or neodymium oxide, respectively, were ground in an agate mortar, and subsequently heated in a corundum crucible to 1200°C for 30 hours. Table 1 gives compositions, colors, and densities of praseodymium- and neodymium orthotantalates. The compounds have the compositions $PrTaO_4$ and $NdTaO_4$. The magnetic susceptibility of praseodymium- and neodymium orthotantalates was determined by L. Gouy's method (Ref.5); results are given in Table 2. In the temperature range of

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Praseodymium- and Neodymium Orthotantalates S/078/61/006/001/016/019
B017/B054

78 - 290°K, these compounds are paramagnetic and follow Curie and Weiss's law. The effective magnetic moments determined agreed with those indicated in publications (Ref.7). G. A. Smolenskiy is mentioned. There are 2 tables and 7 references: 5 Soviet, 1 French, and 1 German.

ASSOCIATION: Ural'skiy politekhnicheskiy institut (Ural Polytechnic Institute)

SUBMITTED: April 25, 1960

Card 2/2

21752

5.2610 1043, 1273, 1160

S/078/61/006/005/006/015
B121/B208

AUTHORS: Krylov, Ye. I., Sanatina, V. N., and Shtol'ts, A. K.

TITLE: Synthesis and properties of orthoniobates of rare earth elements

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 6, no. 5, 1961, 1135 - 1137

TEXT: According to I. S. Morozov (Ref. 2: Zh. neorgan. khimii, 1, 791 (1956)) niobic acid forms metaniobates of the composition $R(NbO_3)_3$ (R = La, Ce, Pr, Nd) with the hydroxides of rare earths at elevated temperatures. The present paper deals with the synthesis of the orthoniobates of lanthanum, cerium, praseodymium and neodymium. The magnetic properties of the compounds were studied. The anhydrous rare earth oxides were subjected to heat treatment with niobium pentoxide in a ratio corresponding to the orthoniobates. This was made in quartz crucibles at a temperature of 1100°C for 12 - 15 hr. The formation of orthoniobates was confirmed by chemical and X-ray analysis. The resultant orthoniobates have the follow-

X

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Synthesis and properties of ...
S/078/61/006/005/006/015
B121/B208

ing colors and compositions:

$LaNbO_4$: gray, 54,0 % La_2O_3 and 44,5 % Nb_2O_5.

$CeNbO_4$: darkolive-green, 53,4 % CeO_2 and 40,9 % Nb_2O_5.

$PrNbO_4$: pistachio-green, 53,21 % Pr_2O_3 and 44,67 % Nb_2O_5.

$NdNbO_4$: gray-violet, 54,4 % Nd_2O_3 and 44,05 % Nb_2O_5.

X-ray analyses disclosed that the orthoniobates of the ceria earths have an isostructure with fergusonite. The lattice parameters of the orthoniobates of cerium, praseodymium and neodymium differ little. The magnetic susceptibility of the orthoniobates of ceria earths were studied; the results are presented in Table 4. Lanthanum orthoniobate was found to be diamagnetic, cerium orthoniobate paramagnetic; the temperature dependence of the magnetic susceptibility follows the Curie law, while that of the orthoniobates of praseodymium and neodymium follows the Curie-Weiss law. There are 4 tables and 6 references: 5 Soviet-bloc and 1 non-Soviet-bloc.

ASSOCIATION: Ural'skiy politekhnicheskiy institut
(Ural Polytechnic Institute)

Card 2/3

S/078/62/007/004/005/016
B110/B101

AUTHORS: Krylov, Ye. I., Dmitriyev, I. A., Strelina, M. M.

TITLE: Thermal decomposition of potassium- and sodium meta-niobate

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 4, 1962, 803-806

TEXT: Composition and properties of the thermal decomposition products of sodium- and potassium meta-niobate were studied in vacuo. The aggregation of volatile dissociation products in the reaction zone was controlled in a vacuum unit by means of a McBain quartz spring balance (for K- and Na metals at > 800°C) and by measuring the pressure with a ЛТ-2 (LT-2) manometer tube (for O_2). The alkali metals were condensed in a quartz tube. The bright coating was dissolved in aqua dest, and titrated with 0.1 N HCl. Tests were first conducted at 400-800°C and $1\cdot10^{-4}$ mm Hg. Pure O_2 was separated in the decomposition of $NaNbO_3$ in Pt-, Ta- and quartz vessels. The rate of separation was in the sequence Ta > quartz > Pt. Further experiments were, therefore, conducted in Ta vessels saturated with O_2. A $KNbO_3$ weighed portion was heated for several hours at 750°C, until constant oxygen pressure was established. The reaction vessel was cooled to room

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temperature and the oxygen pressure was lowered to $1\cdot10^{-4}$ mm Hg. Decrease of the equilibrium pressure of O_2 proves that the system is bivariant and possesses two degrees of freedom (temperature and concentration of the solid decomposition product in the initial meta-borate). No new phase was formed in the decomposition of $KNbO_3$ at 400-750°C, as it is only impoverished in O_2. Niobium bronze is formed with good conductivity, slight paramagnetism, and alkali- and acid resistance. $NaNbO_3$ and $KNbO_3$ decompose at $>750^{\circ}C$ under separation of alkali metals, the degree of decomposition increasing with the temperature. $KNbO_3$ decomposes more easily than $NaNbO_3$. The color changes from greenish-blue at 750-800°C towards black at 1200°C. The residue was investigated roentgenographically. A great number of lines proves here the presence of NbO_2. The origin of the remaining lines has not yet been explained. There are 2 figures and 4 tables.

ASSOCIATION: Ural'skiy politekhnicheskiy institut im. S. M. Kirova (Ural Polytechnic Institute imeni S. M. Kirov)

SUBMITTED: April 7, 1961

Card 2/2

KRYLOV, Ye.I.; DMITRIYEV, I.A.; STRELINA, M.M.

Thermal decomposition of potassium and sodium metaniobates.
Zhur.neorg.khim. 7 no.4:803-806 Ap '62. (MIRA 15:4)

1. Ural'skiy politekhnicheskiy institut im. S.M.Kirova.
(Potassium niobates) (Sodium niobates)

YEGOROV, Yu.V.; KRYLOV, Ye.I.; TKACHENKO, Ye.V.

Analysis of the sorption capacity of iron hydroxide. Trudy Ural. politekh.inst.no.121:39-44 '62. (MIRA 16:5)

(Iron hydroxides) (Sorption)

YEGOROV, Yu.V.; KRYLOV, Ye.I.

Effect of the mass of a collector (hydrated oxide) on the sorption of trace amounts of certain radioactive isotopes. Radiokhimiia 5 no.2:205-211 '63.

Characteristics of the sorption of strontium 90 by active manganese dioxide. 211-215 (MIRA 16:10)

SANNIKOV, Yu.I.; KRYLOV, Ye.I.; ZOLOTAVIN, V.L.

Magnetic susceptibility of iron vanadates. Zhur.neorg.khim. 8 no.5:1157-1160 My '63. (MIRA 16:5)

1. Ural'skiy politekhnicheskiy institut imeni S.M.Kirova.
(Iron vanadates--Magnetic properties)

KRYLOV, Ye.I.; Pinayeva-Strelina, M.M.

Orthotantalates of lanthanum, samarium, and europium. Zhur.
neorg. khim. 8 no.10:2254-2257 O '63. (MIRA 16:10)

1. Ural'skiy politekhnicheskiy institut im. S.M. Kirova.
(Tantalum compounds) (Rare earth compounds)

KRYLOV, Ye.I.; SANATINA, V.N.

Samarium and europium orthoniobates. Zhur. neorg. khim. 8 no.11:2507-2509 N '63. (MIRA 17:1)

1. Ural'skiy politekhnicheskiy institut.

NIKOLAYEV, V.M.; BAGRETSOV, V.F.; KRYLOV, Ye.I.; ROGOV, V.M.

Sorption of microquantities of cesium 134 by vermiculite under dynamic conditions. Zhur.prikl.khim. 37 no.7:1435-1442 Jl '64.
(MIRA 18:4)

BARUKOV, V.I.; SANATINA, V.N.; LAPITSKIY, A.V.; [illegible], [illegible]; [illegible], Ye.I.

Magnetic properties of potassium salts of niobium heteropolyacids. Zhur. neorg. khim. 10 no.1:272-275 Ja '65. (MIRA 18:11)

1. Submitted Sept. 16, 1963.

71

[illegible] lithium niobate, niobate, niobium, [illegible]

L 3680-66 EPF(c)/EWT(m)/EWP(k)/EWA(c)/EWP(b)/EWP(t) IJP(c) JD/HW/JG

ACCESSION NR: AP5012966 UR/0078/65/010/005/1017/1021
546.76'11

53
50
B

AUTHOR: Proskurnikov, A. A.; Krylov, Ye. I.
44,55 44,55

TITLE: Synthesis and properties of chromium hydride

SOURCE: Zhurnal neorganicheskoy khimii, v. 10, no. 5, 1965, 1017-1021

TOPIC TAGS: chromium plating, chromium compound, hydride, electrolysis
44,55 ,14

ABSTRACT: This paper is the text of a report given 28 November 1963 at the First Conference on the Chemistry of Inorganic Hydrides, Moscow Institute of General and Inorganic Chemistry im. N. S. Kurnakov, Academy of Sciences SSSR. The authors consider the effect of various factors in electrolysis (electrolyte composition, current density, temperature) on electrolytic synthesis of chromium hydride. The purpose of the study was to determine whether chromic anhydride in the electrolyte can be partially replaced by sodium bichromate. The stability, microstructure and magnetic properties of chromium hydride were also studied. The methods and equipment used are briefly described. Curves are given showing solubility of hydrogen in chromium as a function of CrO_3 and $Na_2Cr_2O_7$ concentrations in the electrolyte

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ACCESSION NR: AP5012966

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at various cathode current densities. Hydrogen solubility in the cathodic chromium increases with a reduction in current density and also with an increase in the concentration of chromium anhydride. Maximum hydrogen concentration (Cr:H = 1:1) is reached at a CrO_3 concentration of 800 g/l. Hydrogen solubility increases with the addition of $Na_2Cr_2O_7$ until a maximum Cr:H ratio of ~0.9 is reached at an electrolytic composition of 200 g/l CrO_3+400 g/l $Na_2Cr_2O_7$. The hydrogen solubility begins to drop off at this point with an increase in $Na_2Cr_2O_7$ concentration. The yield with respect to current also falls off sharply at this point, and therefore current densities should be kept above 15 a/dm^2. It was found that stoichiometric CrH is deposited from an electrolyte containing 400 g/l CrO_3, 400 g/l $Na_2Cr_2O_7$ and 4 g/l H_2SO_4 at current densities from 15 to 50 a/dm^2. Maximum hydrogen absorption in the chrome deposit is observed at a $Na_2Cr_2O_7$:CrO_3 ratio of 0.5-1.2. The magnetic moment of chromium in CrH was calculated on the basis of measurements of susceptibility in the temperature interval from 193 to 295°K. The value of this moment was found to be 1.73 μ_B, which corresponds to a single unpaired electron. Experimental measurements show a value of 1.77 μ_B, which agrees quite well with the theoretical value. Orig. art. has: 8 figures, 2 tables.

ASSOCIATION: Ural'skiy politekhnicheskiy institut im. S. M. Kirova (Ural Polytechnic Institute)

SUBMITTED: 18Jan64

ENCL: 00

SUB CODE: GC, MM

NO REF SOV: 000

OTHER: 008

Card 2/2 KC

L 13103-66 EWT(m)/EWP(w)/T/EWP(t)/EWP(b) IJP(c) JD/JG

ACC NR: AP5025795 SOURCE CODE: UR/0363/65/001/009/1566/1568

47
46 B

AUTHOR: Pinayeva, M. M.; Krylov, Ye. I.; Ryakov, V. M.

ORG: Ural Polytechnic Institute im. S. M. Kirova (Ural'skiy politekhnicheskiy institut)

TITLE: Magnetic properties of gadolinium, dysprosium and holmium oxides and orthotantalates

27 27 27 27

SOURCES: AN SSSR: Izvestiya. Neorganicheskiye materialy, v. 1, no. 9, 1965, 1566-1568

TOPIC TAGS: magnetic susceptibility, gadolinium compound, dysprosium compound, holmium compound, tantalum compound, paramagnetism, magnetic moment

ABSTRACT: The magnetic susceptibility of Gd_2O_3, Dy_2O_3, Ho_2O_3, $GdTaO_4$, $DyTaO_4$, $HoTaO_4$, and Ta_2O_5 was measured by the Faraday method in the range of 291-1273°K in a vacuum at various magnetic field strengths (8100-10200 Oe). It was found to be independent of the magnetic field strength, and to be adequately described by the Curie-Weiss law (except for $GdTaO_4$), $\chi_M = C/(T - \theta)$ and for $GdTaO_4$ by the Curie law $\chi_M = C/T$. The decrease in the Weiss constant from gadolinium and hol-

UDC: 546.65'221 + 546.65'883.5

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L 13103-66

ACC NR: AP5025795

mium oxides to their orthotantalates is attributed to magnetic dilution. All the orthotantalates studied were strongly paramagnetic. The effective magnetic moments were calculated from the formula

$$\mu_{eff} = g\sqrt{I(I+1)}$$

where g is the Lande factor, and were found to be very close to the experimental values for all the compounds studied. In conclusion, the authors express sincere thanks to G. P. Shveykin for providing the apparatus for measurements of magnetic susceptibility. Orig. art. has: 3 tables, 1 formula.

SUB CODE: 07/, 20/ SUBM DATE: 26May65/ ORIG REF: 004/ OTH REF: 005

Card 2/2

PROSKURNIKOV, A.A., KRYLOV, Ye.I.

Magnetic susceptibility of trivalent chromium compounds in chromic acid solutions. Izv.vys.ucheb.zav.; khim.i khim.tekh. 8 no.4:583-586 '65. (MIRA 18)

1. Ural'skiy politekhnicheskiy institut imeni Kirova, kafedra khimii i tekhnologii redkikh elementov.

PODCHAYNOVA, V.N.; CHECHNEVA, A.N., KRYLOV, Ye.I.

Compounds of platinum with phenyl substituted thiosemicarbazides. Zhur. neorg. khim. 10 no.2:535-537 F '65.
(MIRA 18:11)

1. Ural'skiy politekhnicheskiy institut. Submitted May 5, 1964.

L 21190-66 EWT(m)/EWP(j)/EWP(t) IJP(c) JD/HW/RM

ACC NR: AP6008049 SOURCE CODE: UR/0020/66/166/004/0876/0879

AUTHOR: Krylov, Ye. I.; Sharov, V. A.; Degtyarev, V. F.

ORG: Ural Polytechnic Institute im. S. M. Kirov (Ural'skiy politekhnicheskiy institut)

41
B

27

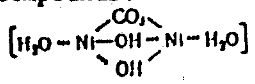
TITLE: Polynuclear complex compounds of nickel carbonate with hydrazine

44

SOURCE: AN SSSR. Doklady, v. 166, no. 4, 1966, 876-879

TOPIC TAGS: nickel compound, hydrazine compound, complex molecule, carbonate

ABSTRACT: The paper reports results pertaining to the synthesis and determination of the structure of basic nickel carbonate $(Ni_2(OH)_2(H_2O)_2 \cdot CO_3$ and complex compounds of the latter with hydrazine, viz., $Ni_2(OH)_2(H_2O)_2N_2H_4CO_3$, $Ni_2(OH)_2(N_2H_4)_{,5}CO_3 \cdot 3H_2O$, and $Ni(N_2H_4)_3CO_3 \cdot 1.5H_2O$. X-ray phase, chemical, and thermographic analyses, determination of electrical conductivity, magnetic susceptibility measurements, and conductometric titration with $HClO_4$ were employed. The experimental data suggest the following structure of these compounds:



$$[H_2O - Ni \overset{CO_3}{\underset{OH}{-OH-}} Ni - H_2O]$$

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L 21190-66
ACC NR: AP6008049

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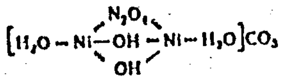

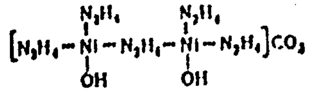

$$[N_2H_4-\underset{OH}{\overset{N_2H_4}{Ni}}-N_2H_4-\underset{OH}{\overset{N_2H_4}{Ni}}-N_2H_4]CO_3$$

It is concluded that hydrazine complexes with an insufficient number of N_2H_4 molecules have a polynuclear structure with hydrazine bridges. The formation of the complexes $[Ni_2(OH)_2\cdot(H_2O)_2N_2H_4]CO_3$ and $[Ni_2(OH)_2(N_2H_4)_5]CO_3\cdot 3H_2O$ from basic nickel carbonate is apparently due to a gradual penetration of N_2H_4 molecules into the inner coordination sphere, $CO_3^=$ then H_2O being displaced into the outer sphere. The paper was presented by Academician I. I. Chernyayev on 9 June 1965. Orig. arg. has: 2 figures, 3 tables.

SUB CODE: 07/ SUBM DATE: 07Jun65/ ORIG REF: 004/ OTH REF: 004

Card 2/2 dlw

L 22055-66 EWT(m)/EWP(t) IJP(c) JD/JW

ACC NR: AP6007905

SOURCE CODE: UR/0149/66/000/001/0031/0033

AUTHOR: Sharov, V. A.; Krylov, Ye. I.

41

ORG: Ural Polytechnic Institute. Rare Metals Dept. (Ural'skiy politekhnicheskiy institut. Kafedra redkikh metallov)

B

TITLE: Production of nickel powder by reducing nickelous hydroxide with hydrazine

4455 27 44411 27

SOURCE: IVUZ. Tsvetnaya metallurgiya, no. 1, 1966, 31-33

27

TOPIC TAGS: powder metal, nickel compound, chemical reluction, hydrazine

ABSTRACT: The reaction was accomplished in air at 21°C in a glass vessel 1 cm in diameter and 8 cm in length, for 33 min, on using pure nickelous hydroxide of the composition 51 $Ni(OH)_2 \cdot NiCO_3 \cdot 4H_2O$ and a 92% solution of N_2H_4 obtained from hydrazine hydrate by Raschig's method (F. Raschig. Ber., vol. 43, 1927 (1910). The solid products of the reaction were filtered, washed with water and alcohol and dried, whereupon they were subjected to X-ray phase analysis and chemical analysis. Findings: $Ni(OH)_2$ does not form complex compounds with N_2H_4, i.e. Ni metal is the sole product of the reaction with hydrazine. Further, the degree of the reduction of $Ni(OH)_2$ increases with increasing concentration of N_2H_4; thus, reduction with 92% hydrazine (solid-liquid ratio 1:2.33) is of the greatest interest from the practical standpoint. It is merely

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ACC NR: AP6007905

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necessary to prevent the spontaneous heating of the mixture, causing the evaporation of hydrazine. The Ni powder thus obtained was analyzed for dispersity and pycnometric density in toluene at 23°C. The density proved to be low, 6.78 g/cm^3, apparently because of the presence of pores. Thus, compared with the previously known methods of producing Ni powder, which are intricate and require intricate apparatus (electrolysis, autoclave treatment, the carbonyl method), the proposed method is simpler and more workable, and yields Ni metal powder that meets the requirements of powder metallurgy. Orig. art. has: 1 figure, 1 table.

SUB CODE: 11, 07/ SUBM DATE: 18Aug64/ ORIG REF: 000/ OTH REF: 004

Card 2/2 mjs

L 42379-66 EWT(m)/T/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6022891 SOURCE CODE: UR/0078/66/011/004/0728/0731

40
B

AUTHOR: Pinayeva, M. M.; Krylov, Ye. I.

ORG: Ural Polytechnic Institute im. S. M. Kirov (Ural'skiy politekhnicheskiy institut)

TITLE: Synthesis and properties of ytterbium 27 and lutetium 27 orthotantalates 27

SOURCE: Zhurnal neorganicheskoy khimii, v. 11, no. 4, 1966, 728-731

TOPIC TAGS: ytterbium compound, lutetium compound, tantalum compound, magnetic susceptibility, x ray diffraction analysis

ABSTRACT: The paper continues a study of the properties of compounds of the general formula ABO_4, formed by rare earth elements with the anion of orthotantalic acid. Ytterbium and lutetium orthotantalates were synthesized from the oxides. Measurements of the magnetic susceptibility of Yb_2O_3, Ta_2O_5, and $YbTaO_4$ in the range of 293-1273°K showed that the temperature dependence of the magnetic susceptibility of Yb_2O_3 and $YbTaO_4$ follows the Curie-Weiss law. The effective magnetic moments of Yb^{3+} in Yb_2O_3 and $YbTaO_4$ were found to be respectively 4.38 and 4.36 μ_B. X-ray diffraction analysis of $YbTaO_4$ at room temperature showed the presence of two phases, one monoclinic (with unit cell parameters a = 5.035, b = 10.82, c = 5.23, β = 84°22'), the other tetragonal (with unit cell parameters a = 5.10, c = 10.81). It was found that $LuTaO_4$ also exists in the form of two phases with parameters a = 5.03, b = 10.78, c = 5.23, β = 84°22'

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L 42879-66

ACC NR: AP6022891

(monoclinio), and a = 5.09, c = 10.79 (tetrahedral). Orig. art. has: 2 figures and 5 tables.

SUB CODE: 07/ SUBM DATE: 30Jul64/ ORIG REF: 004/ OTH REF: 003

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