SMIRNOV, YU.M.

Aggregates

Depictions of systems of open aggregates. Mat. sbor., 31, No. 1, 1952.

Monthly List of Russian Accessions, Library of Congress October 1952 UNCLASSIFIED

USSR/Mathematics - Modern Algebra, Jul/Aug 52
Reflections

"Reflections of Systems of Closed Sets," Yu. M. Smirnov, Moscow

"Matemat Sbor" Vol XXXI (73), No 1, pp 152-166

Poses the problem of characterizing those homomorphisms Y in X which are generated by continuous reflections X in Y, and of constructing according to a given homomorphism a continuous reflection generating it. The aim of current article is to solve this problem for a completely

220T81

regular space X and bicompactum Y. The results obtained are applied further to the problem of continuing continuous reflections with a given space into its given extension and to the problem concerning the difference of bicompact extensions of one and the same space. Submitted 5 Mar 52.

220T81

SMIRNOV, Yu. M.

PA 237T85

USSR/Mathematics - Topology Nov/Dec 52

"Proximity Spaces," Yu. M. Smirnov, Moscow

"Matemat Sbor" Vol 31 (73), No 3, pp 543-574

Systematically investigates proximity spaces and compares them with ordinary topological spaces. Cites similar works (proximity, infinitesimal spaces) of V. A. Yefremovich (1951-52), N. S. Ramm (1951), P. S. Aleksandrov (1950), P. S. Uryson (1950), and A. D. Taymanov (1952).

237T85

Mathematical Reviews
Vol. 14 No. 11
Dec. 1953
Topology

Smirnov, Yu. On proximity spaces in the sense of V. A. Efremovič. Doklady Akad. Nauk SSSR (N.S.) 84, 895–898 (1952). (Russian)

The author considers proximity spaces [cf., e.g., the paper reviewed above] and their relations with uniform spaces. Many results are given without proofs.

A proximity space (briefly, δ-space) R is called maximal if it is closed in any δ-space $S \supset R$. It is shown that a δ-space is maximal if and only if it is compact (as a topological space); every δ-space may be imbedded (in an essentially unique way) in a maximal δ-space; if R is a given completely regular topological space, then there is a one-to-one correspondence between proximity structures on R compatible with its topology and compact spaces containing R topologically as a dense subset.

For a given δ-space R consider the collection (partially ordered in an obvious way) of all uniformities compatible with its proximity structure. It is stated that this collection has a minimum; if R is metrizable, it has a maximum. If such a maximal uniformity exists but does not admit of an extension onto a δ-space $S \supset R$, $S \neq R$, $S = \bar{R}$, then R is called complete. It is stated that any δ-space for which there exists a maximal uniformity may be imbedded in a complete δ-space.

It is to be noted that Theorem 11 of the article is not correct (as pointed out by the author in another note [same Doklady (N.S.) 88, 761–764 (1953), last footnote on p. 762]). *M. Katětov* (Prague).

SMIRNOV, Yu.

Theory of completely regular spaces. Uch.zap.Mosk.un. no.155:137-155 '52. (Spaces, Generalized) (MLRA 8:7)

SMIRNOV, Yu. M.

USSR/Mathematics - Topology, Neighborhood Jul/Aug 53

"Geometry of Neighborhoods, Uniform Geometry, and Topology," M. S. Ramm and A. S. Shvarts, Ivanovo State Pedagog Inst

Mat Sbor, Vol 33 (75), No 1, pp 157-180

Continuation of V. A. Yefremovich's work ("Non-equivalence of Euclidean and Lobachevskian Spaces," Usp Mat Nauk, Vol 4, No 2 (30), 1949). Demonstrate almost all of the results of Yu. M. Smirnov's work ("Spaces of Neighborhoods," Mat Sbor, Vol 31 (73), 1952) by other, often simpler, ways. Further, investigate the interconnection of a numb r of infinitesimal concepts with the concept of neighborhood permits one to simplify considerably the proof of the principal theorems of bicompact extensions. Presented 17 Sep 52.

271T86

SMIRNOV, Yu.

Mathematical Reviews
Vol. 15 No. 2
Feb. 1954
Topology

Smirnov, Yu. On the completeness of proximity spaces. Doklady Akad. Nauk SSSR (N.S.) 88, 761–764 (1953). (Russian)

If P is a proximity space, then a collection ξ of subsets of P is called a c-system if, for every uniform δ-covering [cf. Smirnov, Mat. Sbornik N.S. 31(73), 543–574 (1952); these Rev. 14, 1107], of P, there exists $X \in \xi$ and $\Gamma \in \gamma$ with $X \subset \Gamma$. The completion of P is defined, essentially, as the space cP of all maximal centered $c\delta$-systems [for δ-systems cf. Smirnov, same Doklady (N.S.) 84, 895–898 (1952); these Rev. 14, 1107]: P is called complete if $cP = P$. If P, Q are proximity spaces, then a mapping f of P into Q is called a

(OVER)

c-mapping if the image of any centred c-system is a c-system. A proximity space is called totally bounded if any uniform δ-covering contains a finite subcovering.

The author gives (without proofs) many interesting theorems concerning completion, c-mappings, and total boundedness of proximity spaces. Some characteristic results: (1) cP is the largest of all δ-extensions R of P (i.e., proximity spaces containing P as a dense proximity subspace) such that every uniform δ-covering of P admits of an extension to a uniform δ-covering of R; (2) P is complete if and only if every centred c-system of closed sets has a non-void intersection; (3) a mapping f of P into Q may be extended to a continuous mapping of cP into cQ if and only if f is a c-mapping; (4) each of the following properties is equivalent with the total boundedness of P: (a) cP is compact; (b) every real-valued c-function on P is bounded; (c) every pseudometric in P is bounded; (b) there exists only one uniformity compatible with the proximity structure of P. An example is given of a proximity space possessing no maximal (finest) uniformity. *M. Katětov* (Prague).

SMIRNOV, Yu

Smirnov, Yu. On completeness of uniform spaces and proximity spaces. Doklady Akad. Nauk SSSR (N.S.) 91, 1281–1284 (1953). (Russian)

Let P_Σ denote a proximity space ("δ-space") P with a uniformity Σ. A family ξ of subsets of P_Σ is called a $\Sigma\delta$-collection if it contains arbitrarily small sets and if any $A \in \xi$ is a δ-neighborhood of some $B \in \xi$ [cf. Smirnov, Mat. Sbornik N.S. 31(73), 543–574 (1952); these Rev. 14, 1107]. The set ΣP of all maximal centred $\Sigma\delta$-collections becomes, in a natural way, a δ-space (containing the given space P_Σ). The properties of ΣP are considered; it is stated that the above construction of ΣP works, too, if Σ is a "pseudo-uniformity" (i.e. if the intersection of two entourages is not required to be an entourage).

Let Σ_c denote, for a given δ-space P, the pseudo-uniformity determined by the family of all uniform δ-coverings; then $\Sigma_c P$ is a completion of P [cf. Smirnov, Doklady Akad. Nauk SSSR (N.S.) 88, 761–764 (1953); these Rev. 15, 144]. It is not known whether Σ_c is a uniformity; as the author states, his counterexample [loc. cit., p. 764] is not correct. In the final section of the note, the author considers relations between uniform and proximity spaces generated by a topological group. *M. Katětov* (Prague).

SMIRNOV, Yu.M.

Completeness of proximity spaces. Trudy Mosk.mat.ob-va 3:271-306 '54. (MLRA 7:7)
(Spaces, Generalized)

SMIRNOV, Yu.M.

Dimension of proximity spaces. Dokl.AN SSSR 95 no.4:717-720 Ap '54. (MLRA 7:3)
(Spaces, Generalised)

SMIRNOV, Yu.M

SUBJECT USSR/MATHEMATICS/Topology CARD 1/2 PG - 15
AUTHOR SMIRNOV Ju.M.
TITLE On the completeness of the neighborhood spaces II.
PERIODICAL Trudy Moskovsk. mat. Obšč. 4, 421-438 (1955)
reviewed 5/1956

The author remarks that the construction of the δ-extension cP of the δ-space P given in the first part of this work (Trudy Moskovsk. mat. Obšč. 3, 271-306 (1954)) can be accomplished in an analogous manner by use of the c-ends if one uses instead of the system Σ_c of all uniform δ-coverings of P an arbitrary "pseudo-uniform" structure on P, i.e. a system Σ of coverings of P with the properties: Every covering, having an element of Σ inscribed, belongs to Σ; to every $\alpha \in \Sigma$ there exists a $\beta \in \Sigma$ star-inscribed in α; two sets $A,B \subseteq P$ are δ-neighbored exactly then if in every $\gamma \in \Sigma$ there exists a $\Gamma \in \gamma$ with $\Gamma \cap A \neq 0$, $\Gamma \cap B \neq 0$. Such a Σ is especially given by every uniform structure on P (compare Smirnow, Mat.Sbornik, n. Ser. 31, 543-574 (1952)). Analogous to $cP = \Sigma_c P$ for every Σ one obtains a δ-extension ΣP of P. It is the greatest of all δ-extensions of P on which every open covering of Σ can be continued to an open covering. ΣP is the δ-space of the completion of the pseudo-uniform space $P_\Sigma = (P, \Sigma)$. From this there result two criteria of completeness for (pseudo-) uniform spaces. The c-mappings of part I can also be generalized analogously to Σ-mappings. There are exactly those mappings which can be extended to continuous mappings of ΣP in $\Sigma' P'$. P_Σ is precompact

Call Nr: AF 1108825

Transactions of the Third All-union Mathematical Congress (Cont.) Moscow, Jun-Jul '56, Trudy '56, V. 1, Sect. Rpts., Izdatel'stvo ANSSSR, Moscow, 1956, 237 pp.
There are 11 references, all of them USSR.

Card 44/80

SMIRNOV, Yu. M.

Smirnov, Yu. M. On strongly paracompact spaces. Izv. Akad. Nauk SSSR. Ser. Mat. 20 (1956), 253–274. (Russian)

The following four conditions are shown to be equivalent for a regular topological space R: every open covering of R has a star-finite (star-countable) open (closed) refinement (with "star-finite open", we have the well-known definition of strongly paracompact or S-spaces). Properties of metric S-spaces are considered [for some of them cf. K. Morita, Math. Japon. 1 (1948), 60–68; MR 10, 204]. It is shown that, for a metrizable R, if there exists a closed continuous transformation f of R into B_τ such that every $f^{-1}(y)$ is separable, then R is an S-space; if R is an S-space, then there exists a continuous transformation of R into B_τ such that every $f^{-1}(y)$ is separable (B_τ denotes, essentially, the topological product of countably many discrete spaces of power τ). Examples are given showing that the above implications cannot be reversed.

M. Katětov (Prague).

SUBJECT USSR/MATHEMATICS/Topology CARD 1/1 PG - 764
AUTHOR SMIRNOV Ju.M.
TITLE On the metric dimension in the sense of P.S.Alexandrov.
PERIODICAL Izvestija Akad.Nauk 20, 679-684 (1956)
reviewed 5/1957

In the sense of Alexandrov the metric dimension of a given point set M is the smallest integer $r \geqslant 0$ for which there exists an arbitrarily small ε-displacement of the set M into a locally finite r-dimensional polyhedron. The invariant of the set M which is defined in this way, is denoted with $\delta\,\mathrm{m}M$. The author proves the inequation of Uryson

$$\delta\,\mathrm{m}(A \cup B) \leq \delta\,\mathrm{m}A + \delta\,\mathrm{m}B + 1$$

and the theorem:
For every set A of the metric space M there exists a set $H \subseteq M$ of the type G_δ such that $A \subseteq H$ and $\delta\,\mathrm{m}H = \delta\,\mathrm{m}A$.
The theorem is an analogue to an earlier result of Tumarkin (Math.Ann. 98, 640-656 (1925)).

SMIRNOV Yu M.

SUBJECT USSR/MATHEMATICS/Topology CARD 1/1 PG - 69
AUTHOR SMIRNOV Ju.M.
TITLE On the dimension of the neighborhood spaces.
PERIODICAL Mat. Sbornik, n. Ser. 38, 283-302 (1956)
reviewed 6/1956

The paper contains in essential the detailed proofs for the most of the theorems on the δ-dimension δdP of a δ-space P, given in an earlier paper of the author (Doklady Akad. Nauk 95, 717-720(1954)). The most interesting part in most of the proofs is naturally the theorem that $\delta dP = \dim uP$.- For the theorems on the dimension of a completely-regular space R the author corrects an error in the earlier paper: The δ-structure induced from R onto a closed set $A \subseteq R$ must not be maximal δ-structure on A. The theorem on the dimension R (monotony, sum theorem) hold also under the stronger assumption that the subspaces A of R considered in them are completely-closed, i.e. that every bounded function being defined on A can be continued continuously on the whole R. For these theorems on the dimension of completely-regulary spaces compare also Katětov (Časopis Mat.Fys, Praha 75, 79-87).

Smirnov Yu.M.

SUBJECT USSR/MATHEMATICS/Topology CARD 1/1 PG - 988
AUTHOR SMIRNOV Yu.M.
TITLE The geometry of infinite uniform complexes and the δ-dimension of point sets.
PERIODICAL Mat.Sbornik,n.Ser. 40, 137-156 (1956)
reviewed 7/1957

In an earlier publication (Doklady Akad.Nauk 95, 717-720 (1954)) the author has introduced the notion of the δ-dimension for δ-spaces and he has announced some theorems about them. Most of these theorems in the meantime are proved in detail (cf. Mat.Sbornik,n.Ser. 38, 283 (1956)). In the present paper the author proves the following announced theorem on the δ-dimension of point sets A in the Euclidean R^n: For the fact that $A \subseteq R^n$ has the δ-dimension n it is necessary and sufficient that there exists a number $r>0$ such that for every $\varepsilon > 0$ in the R^n there exists a sphere of the radius r in which A is an ε-net. For the proof the so-called uniform complexes $\subseteq R^n$ are used. These are such ones for which the simplexes are bounded from above and below in a certain manner. The geometric properties of these complexes are investigated.

SMIRNOV, Yu. M.

NEW

2

Smirnov, Yu. M. On the metrizability of bicompacta decomposable into a sum of sets with countable basis. Fund. Math. 43 (1956), 387–393. (Russian)

Let R be a locally countably compact Hausdorff space that can be written as the union of a countable number of subspaces each having a countable basis. Then R itself has a countable basis and is hence metrizable. This interesting, and general, result shows in particular that no bicompact non-metrizable Hausdorff space is the union of two metrizable subspaces, and hence answers in the negative a question raised by Aleksandrov and Uryson [Trudy Mat. Inst. Steklov. 31 (1950), p. 85; MR 13, 264].

E. Hewitt (Seattle, Wash.).

SMIRNOV, Yuriy Mikhaylovich -- awarded sci degree of Doc Physical-Math Sci for 20 Jun 57 defense of dissertation: "Research in general and proportional topology by the integument method" at the Council, Mos State Univ imeni Lomonosov; Prot No 1, 11 Jan 58.

(BMVO, 6-58, 10)

20-6-4/47

AUTHOR: SMIRNOV, Yu.

TITLE: Example of a Onedimensional Normal Space Which is Contained in no One-dimensional Bicompactum (Primer odnomernogo normal'nogo prostranstva, ne soderzhashchegosya ni v kakom odnomernom bikompakte)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 117, Nr 6, pp 939-942 (USSR)

ABSTRACT: The author comprehends onedimensional in the sense of the inductive dimension according to Uryson (induction with respect to points).
Vedenisov [Ref.4] has proved for zerodimensional normal spaces that they always have a bicompact extension. In the present paper the author constructs a onedimensional normal space which is contained in no onedimensional bicompactum. Therewith all efforts to extend the general result of Wallmen [Ref.2] on normal spaces with the dimension dim defined by coverings to general normal spaces with the inductive dimension ind can be omitted.
4 Soviet and 2 foreign references are quoted.

PRESENTED: By P.S.Aleksandrov, Academician, 21 June 1957
SUBMITTED: 15 June 1957
AVAILABLE: Library of Congress
Card 1/1

SOV/20-120-6-10/59

AUTHOR: Smirnov, Yu.

TITLE: An Example of a Non-Semibicompact Completely Regular Space With Zero Dimensional Chekhov complement (Primer vpolne regulyarnogo prostranstva s nul'mernym chekhovskim narostom, ne obladayushchego svoystvom semibikompaktnosti)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 120, Nr 6, pp 1204-1206 (USSR)

ABSTRACT: By construction of an example the author shows that the result of Freudenthal [Ref 1,2] (see the preceding review) is not right in the general case.
Starting from the normal null-dimensional space M of Dowker [Ref 3] with ind M = 0, dim M > 0 the author constructs with the aid of a point A a normal space P with ind (P\A) = 0 but ind P > 0 (Here ind is understood in the sense of Uryson, it is defined by induction with respect to points. It always holds ind R ≤ Ind R, where Ind is understood in the sense of Čech, i.e. it is defined by induction with respect to closed sets). Let αP be a bicompact extension of P, $\aleph_\tau$ the power of αP and $T_{\tau+1}$ the bicompact space of all ordinal numbers which are not higher than the first ordinal number $\omega_{\tau+1}$. Let

$U_{\tau+1} = T_{\tau+1} \setminus \omega_{\tau+1}$.

Card 1/2

An Example of a Non-Semibicompact Completely Regular Space With Zero Dimensional Chekhov complement

SOV/20-120-6-10/59

Points and sets of αP are identified with corresponding points and sets of $\alpha P \times \omega_{\tau+1}$. The sought completely regular space is defined as follows :

$$W = (\alpha P \times T_{\tau+1}) \setminus (P \setminus A) = (\alpha P \times U_{\tau+1}) \cup (\alpha P \setminus P \setminus A).$$

The bicompact $\alpha P \times T_{\tau+1}$ is a Čech extension βW of the space W and it is ind $(\beta W \setminus W) = 0$. On the other hand W is not semibicompact.

There are 6 references, 3 of which are Soviet, 2 American, and 1 Dutch.

PRESENTED: February 11, 1958, by P.S. Aleksandrov, Academician

SUBMITTED: January 30, 1958

1. Mathematics 2. Topology

Card 2/2

AUTHOR: Smirnov, Yu.

SOV/20-123-1-9/5

TITLE: Example of a Zero-Dimensional Normal Space, the Dimension of Which is Infinite in the Sense of the Coverings (Primer nul'mernogo normal'nogo prostranstva, imeyushchego beskonechnuyu razmernost' v smysle pokrytiy)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 123, Nr 1, pp 40-42 (USSR)

ABSTRACT: The zero-dimensionality is understood in the sense of the "small" inductive dimension ind (induction with respect to points). Let dim be the dimension defined with the aid of finite open coverings. By generalizing the construction of Dowker [Ref 1] the author obtains a normal space M for which ind M = 0 and dim M = ∞.
There are 3 references, 1 of which is Soviet, and 2 Canadian.

ASSOCIATION: Moskovskiy gesudarstvennyy universitet imeni M.V.Lomonosova (Moscow State University imeni M.V.Lomonosov)

PRESENTED: June 9, 1958, by P.S.Aleksandrov, Academician
SUBMITTED: May 6, 1958

Card 1/1

YEGOROV, V.I. and SMIRNOV, Yu. M.

"Uniform Homologies."

Transactions of the 3rd All-Union Mathematical Conference in Moscow. vol. 4, Moscow, 1959.

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AUTHOR: Smirnov, Yu. M.

TITLE: The Theorem of P. S. Aleksandrov on Essential Mappings

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya matematiki, mekhaniki, astronomii, fiziki, khimii, 1959, No. 5 pp. 43-48

TEXT: The author gives a purely set-theoretical proof (without the aid of the approximation theorems of combinatorial topology) of the theorem of P. S. Aleksandrov: For a normal space R it is dim R = n if and only if R can be essentially mapped onto an n-dimensional simplex, while an essential mapping onto a simplex of higher dimension is impossible.
The proof uses the following theorem 2: For every topological space R it is dim R $< n$, $n = 0, 1, 2, \ldots$ if and only if into every open cover of $n + 1$ elements an open cover of multiplicity $< n + 1$ can be inscribed.
The author mentions Uryson.
There are 4 references: 2 Soviet, 1 German and 1 English

SUBMITTED: April 11, 1957

Card 1/1

16(1)
AUTHOR: Smirnov, Yu.M. SOV/38-23-2-3/10

TITLE: On Universal Spaces for Some Classes of Infinite-Dimensional Spaces (Ob universal'nykh prostranstvakh dlya nekotorykh klassov beskonechnomernykh prostranstv)

PERIODICAL: Izvestiya Akademii nauk SSR, Seriya matematicheskaya, 1959, Vol 23, Nr 2, pp 185 - 196 (USSR)

ABSTRACT: For spaces which are infinite-dimensional in the weakest sense and which possess a denumerable base (spaces which are decomposed into a sum of denumerably many closed finite-dimensional sets) the author proves the existence of a universal space. He constructs a compactum which is decomposed into the sum of denumerably many zero-dimensional sets, but which is not infinite-dimensional also in the weakest sense. The large transfinite dimension Ind is introduced. Altogether there are 5 theorems and 8 lemmata. The following Soviet mathematicians are mentioned : Ye. Sklyarenko, Uryson, B. Levshenko, and N.A. Shanin.

On Universal Spaces for Some Classes of Infinite-Dimensional Spaces SOV/38-23-2-3/10

There are 11 references, 6 of which are Soviet, 2 German, 1 English, 1 Japanese, and 1 Czech.

PRESENTED: by P.S. Aleksandrov, Academician

SUBMITTED: June 7, 1958

Card 2/2

SMIRNOV, Yu.M.

Some remarks on transfinite dimensionality. Dokl. AN SSSR 141 no.4:814-817 D '61. (MIRA 14:11)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova. Predstavleno akademikom P.S. Aleksandrovym.
(Distance geometry)

SMIRNOV, Yu. M.

"Some questions in the theory of uniform topology"
To be presented at the IMU International Congress of Mathematicians 1962 - Stockholm, Sweden, 15-22 Aug 62

Moscow State University

SMIRNOV, Yu. M. (Moskva)

On transfinite dimensionality. Mat. sbor. 58 no.4:415-422 D '62. (MIRA 16:1)

(Dimensional analysis)

SMIRNOV, Yu.M. (Moskva)

Dimensionality of growths of bicompact expansion of proximity and topological spaces. Mat. sbor. 69 no.1:141-160 Ja '66. (MIRA 19:1)

1. Submitted July 31, 1965.

ACC NR: AM6008486 Monograph UR/

Presnukhin, Leonid Nikolayevich; Smirnov, YUriy Matveyevich; Solomonov, Lev Anatol'yevich; Temnov, Ivan Vasil'yevich

Principles of computer design (Osnovy rascheta i proyektirovaniya schetno-reshayushchikh ustroystv) Moscow, Izd-vo "Vysshaya shkola", 1965. 459 p. illus., biblio. Textbook for students of technical higher educational institutions. 10,000 copies printed.

TOPIC TAGS: computer design, computer component, pulse counter

PURPOSE AND COVERAGE: This textbook has been approved by the Ministry of Higher and Secondary Special Education USSR and is intended for students in advanced instrument-building courses in schools of higher education. It may also be useful to designers, engineers, and technicians concerned with calculation and design of computers and mathematical machines. The author's intention was to create a practical manual on the calculation and design of computers and calculators containing typical examples of calculations as well as recommendations on the selection of elements and the construction of designed circuits, taking their operating conditions, production, and technology into consideration. Ch.I and III were written by L. N. Presnukhin, Ch.II by I. V. Temnov, Ch.IV. by Yu. M. Smirnov, and Ch.V. by L. A. Solomonov

Card 1/3

The general arrangement was supervised by L. N. Presnukhin. There are 36 references, all Soviet.

TABLE OF CONTENTS:

ACC NR: AM6008486

AVAILABLE: Library of Congress

SUB CODE: 09/ SUBM DATE: 16Jun65/ ORIG REF: 036

Card 3/3

Smirnov Yu.N

AID Nr. 983-1 5 June

STRUCTURE OF TANTALUM AT HIGH TEMPERATURES (USSR)

Amonenko, V. M., B. M. Vasyntinskiy, G. N. Kartmazov, Yu. N. Smirnov, and V. A. Finkel'. Fizika metallov i metallovedeniye, v. 15, no. 3, Mar 1963, 444-449. S/126/63/015/003/016/025

The Physicotechnical Institute, Academy of Sciences USSR, has studied the structure of Ta at 20 to 2600°C and the effect of vacuum heat treatment on the structure and properties. X-ray diffraction patterns obtained with a high-temperature x-ray camera in a vacuum of $3 \cdot 10^{-5}$ mm Hg showed that the body-centered cubic structure of Ta remains unchanged at all temperatures tested. The lattice parameter "a" increases from ~3.3030 kX at 20°C to 3.3750 kX at 2600°C. The coefficient of thermal expansion was calculated from "a." Annealing in a vacuum of $3 \cdot 10^{-5}$ to $1 \cdot 10^{-3}$ mm Hg at temperatures up to 2200°C was found to increase "a" and microhardness. Curves of these two parameters versus temperature show maxima under all conditions tested; their magnitude increases with increasing pressure. With a constant annealing

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AID Nr. 983-1 5 June

STRUCTURE OF TANTALUM [Cont'd] S/126/63/015/003/016/025

time of 10 min these maxima occur at 1600° to 1800°C under all pressures tested. With prolonged annealing the maxima are shifted toward lower temperatures, occurring at ~1500-1600°C with annealing for 6 hrs. Both phenomena are attributed to gas absorption by the Ta. X-ray diffraction patterns of a specimen annealed for 15 hrs showed the lines of two high-temperature modifications of Ta_2O_5 at 1460 to 1490°C and 1500 to 1540°C. [ND]

Card 2/2

SMIRNOV, Yu.N.; FINKEL', V.A.

X-ray study of a chromium structure at 40-725°C. Fiz. met. i metalloved. 16 no.4:637 O '63. (MIRA 16:12)

1. Fiziko-tekhnicheskiy institut AN UkrSSR.

L 16451-65 EWT(m)/EWP(t)/EWP(b) Pad IJP(c)/ESD(t)/SSD/AFWL JD/HW

ACCESSION NR: AP4042045 S/0126/64/017/006/0877/0880

AUTHOR: Bolgov, I. S.; Smirnov, Yu. N./ Finkel', V. A.

TITLE: Phase transformations in cobalt

SOURCE: Fizika metallov i metallovedeniye, v. 17, no. 6, 1964, 877-880

TOPIC TAGS: cobalt, first order transition, second order transition, hexagonal structure, face centered structure, thermal expansion, anomaly

ABSTRACT: The cobalt structure at temperatures above 400 C has not been adequately studied. The authors, therefore, investigated the structure of high-purity cobalt at temperatures ranging from 20 to 1300 C. Electrolytic 80 x 8 x 2 mm plates were vacuum annealed at 300 C for several hours and their structure examined in a high-temperature vacuum x-ray chamber. The length - cross sectional ratio of the specimens provided an isothermal area of at least 10 mm in the center which was x-rayed. The authors found that a first order transition occurred from hexagonal α-Co to face-centered β-Co at 403 to 420 C during heating. The $\beta \rightarrow \alpha$ transformation was greatly affected by the cooling rate because of the martensite character of that process. Even when cooling proceeded rather slowly, the minimum

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ACCESSION NR: AP4042045

transformation point was at 320 C. The atomic volume and the coefficient of thermal expansion at different temperatures were computed. It was convenient to calculate the mean coefficient of linear expansion (α) for a comparison between the coefficients of α- and β-Co. At 1100 C an anomaly of the coefficient of thermal expansion was observed. The authors conclude that the anomalous shape of the temperature curve is caused by second order phase transition with ferromagnetic Co changing into a paramagnetic state. Other authors have erroneously attributed the anomaly to first order phase transformation. Orig. art. has: 3 figures and 1 tables.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN UkrSSR (Physico Technical Institute, AN UkrSSR)

SUBMITTED: 23Jul63 ENCL: 00

SUB CODE: MM NO REF SOV: 005 OTHER: 012

Card 2/2

ACCESSION NR: AP4043619 S/0056/64/047/002/0476/0479

AUTHOR: Smirnov, Yu. N.; Finkel', V. A.

TITLE: Crystalline structure of chromium at 113--373K

SOURCE: Zh. eksper. i teor. fiz., v. 47, no. 2, 1964, 476-479

TOPIC TAGS: crystal structure, chromium, low temperature research, cubic crystal, x-ray diffraction analysis, second order phase transition

ABSTRACT: This is a continuation of earlier work by the authors (FMM, v. 12, 771, 1961 and v. 16, 637, 1963), and its purpose was to study further the presence, temperature, and nature of a low-temperature transformation in chromium, since the available data are contradictory. The investigations were made with polycrystalline chromium in the form of a lump of vacuum condensate 99.95% pure. The structure was investigated over a wide range of temperatures by

Card 1/4

ACCESSION NR: AP4043619

by an x-ray diffractometric method. The apparatus and the measurements are described. The results are shown that the unit cell of the body-centered cube is retained in the entire investigated temperature interval. The existence of a second-order phase transition (paramagnetism-antiferromagnetism transition) is confirmed at 317K. It is found that at 168K there is a first-order phase transition which is obviously connected with the change in the magnetic anisotropy at this temperature. Orig. art. has: 2 figures and 1 formula.

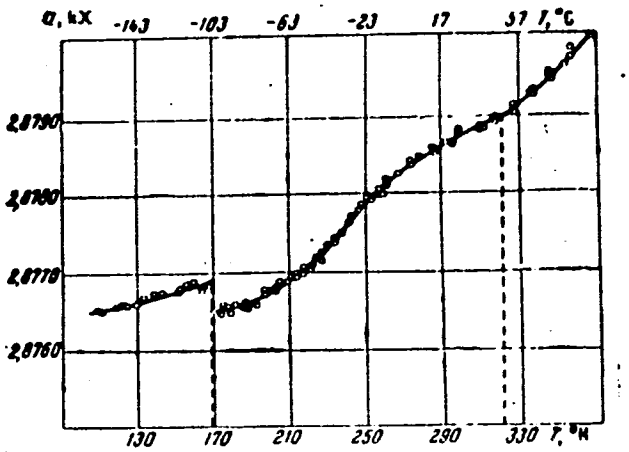
ASSOCIATION: Fiziko-tekhnicheskiy institut Akademii nauk UkrSSR (Physicotechnical Institute, Academy of Sciences, UkrSSR)

SUBMITTED: 21Mar64 ENCL: 02

SUB CODE: MM, SS NR REF SOV: 006 OTHER: 010

ACCESSION NR: AP4043619

ENCLOSURE: 01

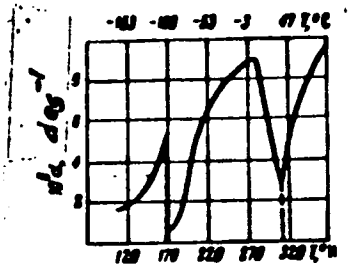


Temperature dependence of crystal lattice parameter

Card 3/4

ACCESSION NR: AP4043619

ENCLOSURE: 02



Temperature dependence of chromium thermal expansion coefficient

Card 4/4

L 14280-66 EWT(m)/EWP(w)/EWA(d)/T/EWP(t) IJP(c) JD/HW/GS

ACC NR: AT6008666 (N) SOURCE CODE: UR/0000/65/000/000/0228/0235

AUTHORS: Akimov, L. M. (Kiev); Kononchuk, N. I. (Kiev); Skladnov, I. K. (Kiev); Zverev, N. I. (Kiev); Pliskin, S. M. (Kiev); Krivenko, M. P. (Kiev); Smirnov, Yu. N. (Kiev); Lazareva, N. M. (Kiev)

ORG: none

TITLE: Investigation of the effects of several factors on the fatigue characteristics of heat resistant alloys used for turbine blade manufacture

SOURCE: Vsesoyuznoye soveshchaniye po voprosam staticheskoy i dinamicheskoy prochnosti materialov i konstruktsionnykh elementov pri vysokikh i nizkikh temperaturakh, 3d. Termoprochnost' materialov i konstruktsionnykh elementov (Thermal strength of materials and construction elements); materialy soveshchaniya. Kiev, Naukova dumka, 1965, 228-235

TOPIC TAGS: heat resistant alloy, metal property, metal fatigue/ EI437B alloy, EI617 alloy, EI867 alloy

ABSTRACT: The effects of several factors on the fatigue characteristics of heat resistant alloys EI437B, EI617 and EI867 were investigated and compared with

Card 1/3

results obtained with a normal cylindrical fatigue specimen. The specimen shown in Fig. 1 was used to obtain fatigue curves ($<2\cdot10^7$ cycles) showing the effects

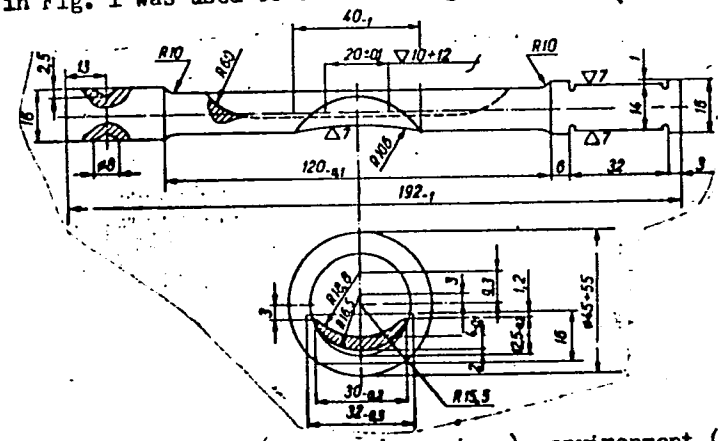


Fig. 1. Specimen geometry.

of shape (blade versus round specimen), environment (air and combustion products), cyclic heat loading, surface plating (calorizing), and temperature (373, 600, 873,

L 14289-66

ACC NR: AT6008666

1070K) on the fatigue properties. It was found that the above factors had the following average effects on the fatigue strength: shape--20-30% lower than round specimen; combustion products--about 25% lower than in air; cyclic heat loads--EI437B (973-473-973K)--30% lower, EI617 (1073-473-1073K)--10% lower, EI867 (1173-473-1173K)--15% lower, calorizing--15% higher; decreased strength with increasing temperature. Orig. art. has: 7 figures.

SUB CODE: 11, 13, 21/ SUBM DATE: 19Aug65

Card 3/3 90

L 08168-67 EWT(m)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6024861 SOURCE CODE: UR/0056/66/051/001/0032/0037

AUTHOR: Finkel', V. A.; Smirnov, Yu. N.; Vorob'yev, V. V. 47 B

ORG: Physicotechnical Institute, Academy of Sciences Ukrainian SSR (Fiziko-technical Institute Akademii nauk Ukrainskoy SSR)

TITLE: Crystal structure of terbium at 120 -- 300K

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 51, no. 1, 1966, 32-37

TOPIC TAGS: terbium, low temperature research, crystal lattice structure, x ray diffraction analysis, phase transition, paramagnetism, antiferromagnetism

ABSTRACT: This is a continuation of an earlier study of the crystal structure of rare earth metals (REM) (ZhETF v. 49, 1774, 1965), which was devoted to gadolinium. The present study was devoted to 99.5% pure polycrystalline terbium. The low-temperature x-ray diffraction procedure employed was also described by the authors earlier (ZhETF v. 47, 84, 1964 and v. 49, 1077, 1965). The tests were made at temperatures 120 -- 300K. The results show that at 234K there a λ-anomaly of the coefficient of linear expansion, connected with the transition of the paramagnetic terbium into the antiferromagnetic state. At 223K a jump in the atomic volume is observed, signifying that the transition of the antiferromagnetic helicoidal structure into a ferromagnetic one (with colinear ordering) is a first-order transition. A small rhombic

Card 1/2

L 10444-67 EWT(m)/EWP(t)/ETI IJP(c) JD/JG

ACC NR: AP6023705 SOURCE CODE: UR/0126/66/021/004/0620/0621

AUTHORS: Vasyutinskiy, B. M.; Kartmazov, G. N.; Smirnov, Yu. N.; Finkel', V. A.

ORG: Physico-Technical Institute, AN UkrSSR (Fiziko-tekhnicheskiy institut AN UkrSSR)

TITLE: Investigation of the crystalline structure of niobium and vanadium at high temperatures

SOURCE: Fizika metallov i metallovedeniye, v. 21, no. 4, 1966, 620-621

TOPIC TAGS: niobium, vanadium, x ray spectroscopy, crystal lattice parameter

ABSTRACT: The crystal structure of niobium and vanadium was determined as a function of the temperature. The experimental procedure was described earlier by V. M. Amonenko, B. M. Vasyutinskiy, G. N. Kartmazov, Yu. N. Smirnov, and V. A. Finkel' (FMM, 1963, 15, 444). The experimental results are presented graphically (see Fig. 1). It was found that the temperature dependence of the lattice parameters obeyed the following relationship

$$a^{Nb}_{T^\circ C} = 3{,}3001\,(1 + 7{,}223 \cdot 10^{-6} \cdot T + 7{,}867 \cdot 10^{-10} \cdot T^2)\ \text{Å};$$

$$a^{V}_{T^\circ C} = 3{,}0296\,(1 + 7{,}314 \cdot 10^{-6} \cdot T + 2{,}944 \cdot 10^{-10} \cdot T^2)\ \text{Å}.$$

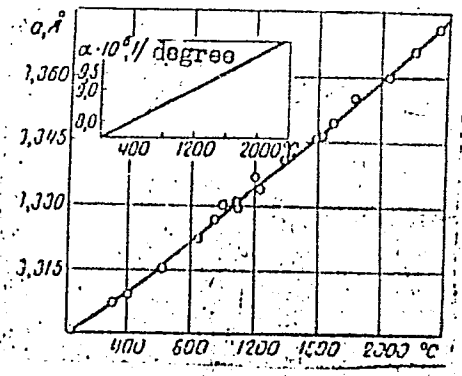
UDC: 548.0:546.881/882

Card 1/2

L 10444-67

ACC NR: AP6023705

Fig. 1. Temperature dependence of the lattice parameter and coefficient of linear expansion of niobium crystal lattice



Orig. art. has: 2 graphs and 2 equations.

SUB CODE: 11/ SUBM DATE: 02Aug65/ ORIG REF: 001/ OTH REF: 004

Card 2/2

ACC NR: AP6036452 SOURCE CODE: UR/0370/66/000/006/0169/0172

AUTHORS: Kruglykh, A. A. (Khar'kov); Pavlov, V. S. (Khar'kov); Smirnov, Yu. N. (Khar'kov)

ORG: none

TITLE: Oxidation of zone-refined cerium

SOURCE: AN SSSR. Izvestiya. Metally, no. 6, 1966, 169-172

TOPIC TAGS: cerium, cerium oxide, oxidation kinetics, oxidation

ABSTRACT: The oxidation kinetics of cerium was studied as a function of the purity of the metal. The experiments were carried out in the temperature region of 150 - 300C. The mass increase of specimens was determined after the method of V. Ye. Ivanov, A. A. Kruglykh, V. S. Pavlov, et al (Opredeleniye uprugostey parov uranosoderzhashchikh soyedineniy. Sb. Termodinamika yadernykh materialov, Vena, 1962, 735). In addition, the microstructure and x-ray structure of the surface of the oxidized specimens were determined. The experimental results are presented in graphs and tables (see Fig. 1). It was found that the oxidation of 99.3% pure cerium follows a linear oxidation law, that of zone-refined cerium (zone-refined up to 200C) follows a parabolic law. The oxidation of high temperature zone-refined cerium (zone-refined above 200C) follows a linear law. The complete combustion of compact 99.3% Ce occurs at 300C. It is concluded that the removal of low-valence type metals from

UDC: 669.855.691

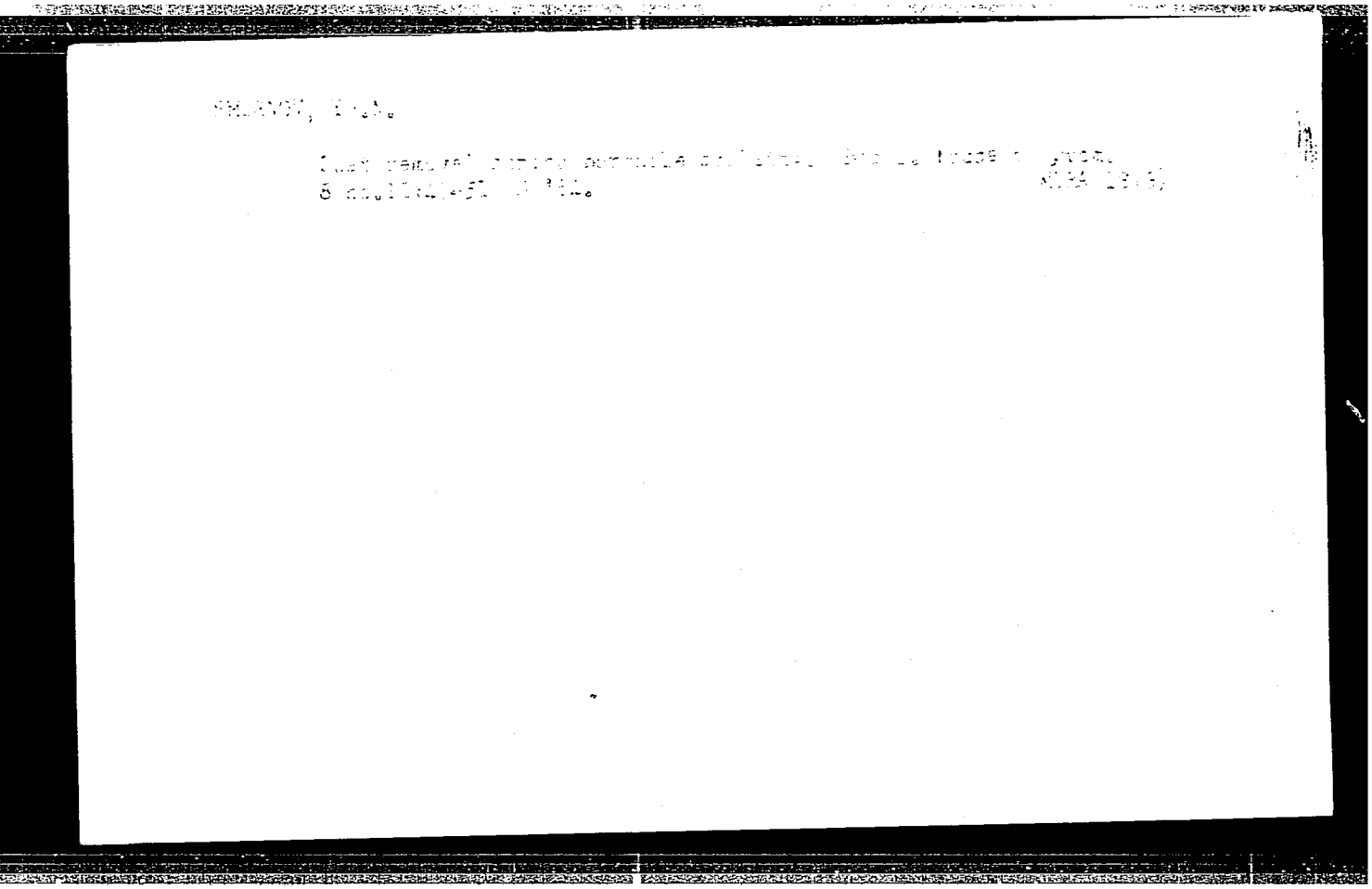
Card 1/2

SMIRNOV, Yu.N.

Two problems in the theory of elasticity with composite boundary conditions. Trudy LPI no.210:79-86 '60. (MIRA 13:11)
(Elasticity)

MAIKY, Yefim Afanas'yevich; SMIRNOV, Yu.N., red.

[Methods for increasing and reducing the hardness of abrasive tools] Metody povysheniia i ponizheniia tverdosti abrazivnykh instrumentov. Leningrad, 1964. 31 p. (MIRA 17:7)



L 65216-65 EWT(m)/EPF(c)/EWP(j)/T RM

ACCESSION NR: AP5011918 UR/0363/65/001/003/0289/0293
546.821:541.6

AUTHOR: Andrianov, K. A.; Kuznetsova, I. K.; Smirnov, Yu. N.

TITLE: Reaction of tetrabutyl titanate with methyl-phosphonic acid esters

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 3, 1965, 289-293

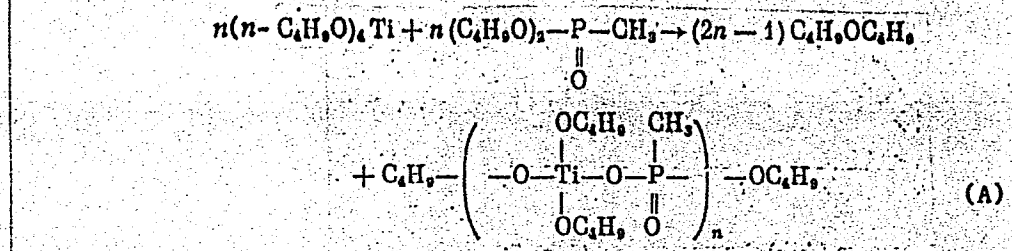
TOPIC TAGS: titanate, organotitanium compound, oligomer, polycondensation

ABSTRACT: Oligomers are prepared with chains made up of alternating atoms of titanium, oxygen and phosphorus by polycondensation of *n*-tetrabutyl titanate with dialkyl esters of methyl-phosphonic acid. The reaction was carried out at 170--200°C without catalysts at initial component ratios of 1:1, 1:2 and 2:1. Polycondensation of *n*-butyl titanate with dibutyl ester of methyl-phosphonic acid in a 1:1 ratio takes place with isolation of the dibutyl ester and formation of oligomers:

Card 1/4

L 65216-65

ACCESSION NR: AP5011918



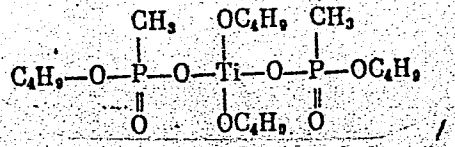
$$n(n\text{-}C_4H_9O)_4Ti + n(C_4H_9O)_2{-}P{-}CH_3 \rightarrow (2n-1)C_4H_9OC_4H_9$$

$$+ C_4H_9{-}\left(\begin{array}{c} OC_4H_9 \quad CH_3 \\ | \quad\quad | \\ -O{-}Ti{-}O{-}P{-} \\ | \quad\quad \| \\ OC_4H_9 \quad O \end{array}\right)_n {-}OC_4H_9 \qquad (A)$$

The authors studied the effect of temperature on the rate of polycondensation. The rate of the reaction was monitored by checking the amount of isolated dibutyl ester. It was found that an increase in temperature increases the completeness and speed of the reaction as well as the oligomer yield. An increase in the duration of isothermal holding at 200°C during the reaction increases the completeness of the reaction and the titanium content in the reaction mixture. However, the relative viscosity of the oligomer solution during polycondensation increases very little (from 1.11 to 1.56). The oligomer prepared by condensation at 200°C for 50 hours with subsequent removal of volatile products at 200°C and 1-0.1 mm Hg is a resinous dark yellow substance with a molecular weight of 4000 which is quite solu-

Card 2/4

ble in alcohols, aromatic hydrocarbons and petroleum ether. The oligomer is easily hydrolyzed with the isolation of butyl alcohol and the formation of an insoluble product. This polymer is deformed at 100°C, but does not flow even at 400°C. Condensation of *n*-tetrabutyl titanate with dibutyl ester of methyl-phosphonic acid in a 1:2 ratio takes place with the formation of a monomer product:



However, reaction of these same initial components in a 2:1 ratio takes place according to scheme (A) with the formation of a polymer product and the excess (1 mol) *n*-tetrabutyl titanate is returned from the reaction. Ultimate analysis and examination of the properties of this polymer product indicate that it is close in structure to the product formed from an initial component ratio of 1:1. The experimental work is described in detail. Orig. art. has: 4 figures, 2formulas, 2 tables.

L 65216-65

ACCESSION NR: AP5011918

3

ASSOCIATION: Institut elementoorganicheskikh soyedineniy Akademii nauk SSSR (Institute of Hetero-organic Compounds, Academy of Sciences SSSR) 44,55

SUBMITTED: 20Oct64 ENCL: 00 SUB CODE: GC, OC

NO REF SOV: 001 OTHER: 000

dm

Card 4/4

L 54699-65 EWT(m)/EPF(c)/EWP(j) Pc-4/Pr-4 RM UR/0363/65/001/003/0301/0306
ACCESSION NR: AP5011920 546.824:54-126

29
28
B

AUTHOR: Andrianov, K. A.; Kuznetsova, I. K.; Smirnov, Yu. N.

TITLE: Reactions of titanium tetra-normal butoxide with phosphonic acids

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 1, no. 3, 1965, 301-306

TOPIC TAGS: titanium butoxide, titanium tetrabutoxide, phosphate, phosphonic acid, oligomer, polymer

ABSTRACT: Oligomers (with a molecular weight of 1500 to 2000 and Ti-O-P bondings) and titanium tetra-monoalkylphosphates were synthesized from titanium tetra-normal butoxide and monomethylphosphonic- and α-phenylvinylphosphonic acids. The titanium tetra-monomethylphosphate treated with an excess of water undergoes partial hydrolysis to methylphosphonic acid and a product of condensation reaction. Two moles of methylphosphonic acid result from each mole of starting titanium tetra-monomethylphosphate. Also two moles α-phenylvinylphosphonic acid result from hydrolysis of titanium tetra-α-phenylvinylphosphate. The product of condensation reaction is water insoluble and its chemical formula is $C_2H_8O_7P_2Ti$. Reaction of titanium

Card 1/2

L 54699-65
ACCESSION NR: AP5011920

tetra-α-phenylvinylphosphate with an excess of triethylbutoxysilanes and titanium tetra-normal butoxide leads to a substitution of hydrogen in the phosphonyl group by triethylsiloxy- and titanium tri-normalbutoxy groups. The titanium tetra-monomethylphosphate reacts with triethylbutoxysilane with formation of butyl alcohol and di-triethylsiloxy-ester of methylphosphonic acid, accompanied by formation of an insoluble product of the formula: $C_2H_6O_6P_2Ti$. In general, two alkylphosphonyl groups split off readily from the titanium tetra-alkylphosphates. It is concluded that only two phosphonyl groups can coordinate with a titanium atom. Orig. art. has: 1 figure and 4 formulas.

ASSOCIATION: Institut elementoorganichesikh soyedineniy Akademii nauk SSSR (Institute of Organoelemental Compounds, Academy of Sciences, SSSR)

SUBMITTED: 24Nov64 ENCL: 00 SUB CODE: OC, GC

NO REF SOV: 003 OTHER: 000

Card 2/2 mlb

L 20100-65 EWT(1)/EWT(m)/EPF(c)/EWG(v)/EWP(t)/EWP(b) Pe-5/Pr-4/Pae-2 IJP(c)
ACCESSION NR: AP5001232 GW/JD S/0033/64/041/006/1084/1089

AUTHOR: Smirov, Yu. N.

TITLE: The formation of hydrogen and He^4 in the prestellar stage of the universe (Gamow model)

SOURCE: Astronomicheskiy zhurnal, v. 41, no. 6, 1964, 1084-1089

TOPIC TAGS: hydrogen formation, helium formation, universe, prestellar stage, Gamow model

ABSTRACT: The formation of light elements (hydrogen, duterium, tritium, He^3, and He^4) in the prestellar stage of the universe was followed within the framework of the Gamow-Alpher-Herman-Hayashi theory (the primordial matter is assumed to be a "hot" mixture of neutrons and protons). The following nuclear reactions were considered: $n + p \rightleftarrows d + \nu$; $d + d \rightarrow He^3 + n$; $d + d \rightarrow t + p$; $n \rightarrow p + e^- + \bar{\nu}$; $d + t \rightarrow He^4 + n$; $He^3 + n \rightarrow t + p$; $He^3 + d \rightarrow He^4 + p$. It is shown that the theory of a "hot" primordial substance does not provide a medium of the proper composition from which first-gener-

Card 1/2

L 20100-65
ACCESSION NR: AP5001232

ation stars could be formed, for when $\rho_1 \leq 10^{-6}$ g/cm^3, a deuterium content amounting to several per cent is obtained and when $\rho_1 \leq 10^{-6}$ g/cm^3 an excessively high He^4 content is obtained, both of which are in conflict with present astrophysical data.(ρ_1 is the nucleon density at the time the total density, determined essentially by radiation, was 1 g/cm^3; at this time t ≈ 670 sec and T ≈ 36.7 kev) The author thanked Academician Ya. B. Zel'dovich for initiating and supporting supporting this work.

ASSOCIATION: none

SUBMITTED: 18Feb64 ENCL: 00 SUB CODE: AA

NO REF SOV: 004 OTHER: 005

Card 2/2

SMIRNOV, Yu.N.

Results of the experimental investigation of plastically deformed zones during rock breaking with cutting tools. Fiz.-tekh. probl. razrab. pol. iskop. no.4:155-157 '65. (MIRA 19:1)

1. Institut fiziki i mekhaniki gornykh porod AN Kirgizskoy SSR, Frunze. Submitted April 7, 1965.

ANDRIANOV, K.A.; KUZNETSOVA, I.K.; SMIRNOV, Yu.N.

Reaction of tetrabutyl titanate with methylphosphinic acid esters. Izv. AN SSSR. Neorg. mat. 1 no.3:289-293 Mr '65.

Reactions of n-tetrabutyl titanate with phosphinic acids. Ibid.:301-306 (MIRA 18:6)

1. Institut elementoorganicheskikh soyedineniy AN SSSR.

MORDYOMA, M.I.; MIGUNOV, Yu.N.

Floor boards made from short-cut wood waste. Der. prom. 14 no.9:30-31 S '65. (MIRA 18:12)

1. Uralpromatroynilproyekt.

L 11956-66 EWT(l)/EWT(m)/EPF(n)-2/T/EWP(t)/EWP(b)/EWA(c) IJP(c) JD/JG/GG

ACC NR: AP5026597 SOURCE CODE: UR/0056/65/049/004/1077/1082

111
102
B

AUTHORS: Smirnov, Yu. N.; Finkel', V. A.

ORG: Physicotechnical Institute, Academy of Sciences, Ukrainian SSR (Fiziko-tekhnicheskiy institut Akademii nauk Ukrainskoy SSR)

TITLE: Crystal structure of tantalum, niobium, vanadium at 110-400K

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 4, 1965, 1077-1082

TOPIC TAGS: crystal structure, tantalum, niobium, vanadium, x ray diffraction analysis, electric resistance, thermal expansion, antiferromagnetism

ABSTRACT: The structures of tantalum, niobium, and vanadium were investigated in the temperature range 110-400K by x-ray diffraction analysis, in view of lack of data on these metals below room temperature. As an auxiliary method, the electrical resistance of these metals was measured in the temperature range 110-300K. Polycrystalline samples with low-temperature attachment was described by the authors earlier (ZhETF v. 47, 476, 1964). The measurement showed that both metals retained their body-centered cubic structure over the entire

Card 1/2

L 17603-66 EWT(1)/T IJP(c) GG

ACC NR: AP6002716 SOURCE CODE: UR/0056/65/049/006/1774/1778

AUTHORS: Vorob'yev, V. V.; Smirnov, Yu. N.; Finkel', V. A.

ORG: Physicotechnical Institute, Academy of Sciences UkrSSR (Fiziko-tekhnicheskiy institut Akademii nauk UkrSSR)

TITLE: Crystal structure of gadolinium at 120 -- 370K

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 6, 1965, 1774-1778

TOPIC TAGS: gadolinium, rare earth metal, second order phase transition, temperature dependence, x ray analysis, crystal lattice structure, magnetic moment

ABSTRACT: The authors have investigated by x ray structure analysis the crystalline structure of polycrystalline gadolinium in the temperature interval 120 -- 370K. The research was motivated by the complexity of the magnetic structures of rare earth metals (presence of both first and second order phase transitions) and by the fact

Card 1/3

L 17603-66

ACC NR: AP6002716

that earlier x ray-structure investigations of gadolinium were made at low temperature and at low accuracy, particularly with regards to the temperature dependence of the crystal-lattice periods in the vicinity of the Curie point and in the 210 -- 250K range. The polycrystalline gadolinium was 99.7 pure and in the form of ground and polished prisms measuring 9 x 13 x 1.5 mm. The test procedure, by means of an URS-50I x ray spectrometer, was described earlier (ZhETF v. 47, 476, 1964). The measurement yielded the temperature dependence of the crystal-lattice parameters, the atomic volume, and the coefficients of linear and volume expansions. A negative λ-anomaly connected with the transition of the ferromagnetic gadolinium into the paramagnetic state, is observed in the coefficient of thermal expansion at 293K. The curve showing the temperature dependence of the atomic volume exhibits a maximum at 200K as a result of a change in the direction of the magnetic moment relative to the [001] axis. This change agrees with the theory of second-order phase transitions and with other experimental data. The complicated character of the dependence of the atomic volume on the temperature in the ferromagnetic region is connected with the complicated character of the temperature

Card 2/3

L 17603-66
ACC NR: AP6002716

dependence of the angle between the direction of the magnetic moment and the hexagonal axis. Orig. art. has: 4 figures.

SUB CODE: 20/ SUBM DATE: 27Jul65/ ORIG REF: 005/ OTH REF: 017

Card 3/3 nst

SMIRNOV, Yu.N., inzh. (Leningrad); TERTEROV, M.N., kand. tekhn. nauk, dotsent (Leningrad)

New developments in the technology of classification yards. Zhel. dor. transp. 47 no. 11:18-22 N '65 (MIRA 19:1)

1. Nachal'nik stantsii Leningrad-Sortirovochnyy-Moskovskiy (for Smirnov).

3431 SMIRNOV YU. P.

Opyt raboty gazosvarshchikanovatora Ivana va il'evicha toropova. L., 1954. 8s s ill 21 sm (vsesoyuz o-vo lo rasporstraneniya polit. I nauch znaniy. Leningr. Dom Nauchtekhn. Propagandy listok noatora. No 20 (259)). 3.800 ekz. 15 k. avt. ukazan v kontse teksta (54-14165 ZH) 621.791.5ST.

GOLOUSHIN, N.S., kand. tekhn. nauk; CHISTYAKOV, V.I.; KULIKOV, V.P.; KISINA, A.M.; LOVETSKIY, L.V.; SMIRNOV, Yu.P.; SHOLENINOV, V.M.

Use of peat semicoke and coke in metallurgy. Trudy VNIITP no.18:238-246 '61. (MIRA 17:1)

1. Leningradskiy politekhnicheskiy institut im. Kalinina (for all except Sholeninov. 2. Cherepovetskiy metallurgicheskiy zavod (for Sholeninov).

BOGOPOL'SKIY, S.N.; GOLOUSHIN, N.S.; GRIGOR'YEVYKH, G.F.; LEVIN, L.Ya.; SMIRNOV, Yu.P.; TKACHEV, V.V.; CHISTYAKOV, V.I.; SHOLENINOV, V.M.; SHUR, A.B.; LOVETSKIY, L.V.

Partial replacement of coke breeze in the sinter charge by peat coke. Stal' 23 no.9:781-785 S '63. (MIRA 16:10)

YAKUBTSINER, N.M.; SMIRNOV, Yu.P.; SHOLENINOV, V.M.

Optimum coarseness of the components of a sintering charge during the sintering of fine-grained concentrates. Trudy LPI no.225: 168-177 '64. (MIRA 17:9)

YAKUBTSINER, N.M.; SVINTSOV, Yu.P.; SMIRNOV, Yu.P.

Heat capacity and heat conductivity of sinters. Trudy LPI no.225: 178-186 '64. (MIRA 17:9)

YAKUBTSINER, N.M., kand. tekhn. nauk; SMIRNOV, Yu.P., inzh.

Automatic control and regulation of the sintering charge moisture. Stal' 24 no.1:9-14 Ja '64. (MIRA 17:2)

1. Leningradskiy politekhnicheskiy institut.

SMIRNOV, Yu.P.

[Development of industrial hygiene organs within the system of Soviet trade unions]Razvitie organov okhrany truda v sisteme sovetskikh profsoiuzov. Minsk, 1959. 48 p. (MIRA 15:8)

(Industrial hygiene)

SEMENKOV, Viktor Ivanovich; SMIRNOV, Yu. P., kand. yurid. nauk, red.; DAVIDOVICH, Z., red.izd-va; ATLAS, A., tekhn. red.

[Supervision and control over industrial safety in the U.S.S.R.] Nadzor i kontrol' za okhranoi truda v SSSR. Minsk, Izd-vo AN BSSR, 1963. 114 p. (MIRA 16:8)
(Industrial safety)

L 11958-66 EWT(1)/EWT(m)/EWP(t)/EWP(b) IJP(c) JD

ACC NR: AP5026587 SOURCE CODE: UR/0056/65/049/004/1019/1021

AUTHORS: Zykov, V. S.; Petrovich, Ye. V.; Smirnov, Yu. P.

ORG: Physicotechnical Institute im. A. F. Ioffe, Academy of Sciences, SSSR (Fiziko-tekhnicheskiy institut Akademii nauk SSSR)

TITLE: Influence of stoichiometry on the Mossbauer effect in tin dioxide

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 49, no. 4, 1965, 1019-1021

TOPIC TAGS: Mossbauer effect, tin compound, line broadening, absorption line, stoichiometry

ABSTRACT: A hypothesis is advanced that one of the causes of the observed broadening of the Mossbauer absorption line in SnO_2 is violation of the exact stoichiometric composition in the samples prepared in the usual manner. To check on this hypothesis, the authors compared the resonance-absorption spectra for two SnO_2 samples of different stoichiometric compositions. One of the absorbers was prepared from tin dioxide produced by dissolving metallic tin in HNO_3 with subsequent evaporation

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26.2330

AUTHORS: Balabanov, Ye. M. and Smirnov, Yu.S.

TITLE: A Comparative Study of the Symmetric and the Usual Cascade Voltage Multiplier

PERIODICAL: Pribory i tekhnika eksperimenta, 1960, No.5, pp.23-27

TEXT: The present paper is concerned with the rectifier-capacitor type of voltage multiplier used in particle accelerators. The usual Cockroft-Walton arrangement shown in Fig.1 is of limited application because of the voltage drop and voltage fluctuations at the output of the multiplier. The present authors have investigated the ordinary voltage multiplier and the symmetric voltage multiplier (Fig.2) described by Heilpern (Ref.2). The experiments were carried out on a small model of a 10-stage cascade generator using capacitors of 0.5 μF (U = 2 kV). Selenium rectifiers of type ABC-6-1000 (AVS-6-1000) were used. Each working rectifier consisted of two rectifiers connected in series. The characteristics of the usual and the symmetric generators were obtained as functions of the load current, the frequency of the supply voltage and the number of stages. The results obtained are reported to be in agreement with the theoretical calculations given by Novikovskiy

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A Comparative Study of the Symmetric and the Usual Cascade Voltage Multiplier

(Ref.3). It was found that by using the symmetric circuit the voltage fluctuations at the output can be reduced very considerably. Thus, for example, the voltage fluctuation in the case of a 9-stage multiplier plotted as a function of the load current is reduced by a factor of approximately 10 at load current of the order of 4 mA. When the fluctuation in the output voltage is plotted as a function of the number of stages, a reduction by a factor of the order of 10 is obtained for the symmetric case as compared with the ordinary case (n = 9). If the supply frequency is increased up to about 1 kc/s, the fluctuation at the output of the symmetric multiplier can be reduced to a value of the order of a few hundredths of a percent at a load current of a few mA. There are 6 figures, 1 table and 3 references: 1 Soviet, 1 Swiss and 1 English.

ASSOCIATION: Fizicheskiy institut AN SSSR (Physics Institute, AS USSR)

SUBMITTED: September 4, 1959

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ZHDANOV, M.M.; KOSTRYUKOV, G.V.; ASFANDIYAROV, Kh.A.; MAKSUTOV, R.A.; KONDAKOV, A.N.; TURUSOV, V.M.; SILIN, V.A.; PILYUTSKIY, O.V.; SHELDYBAYEV, B.F.; PETROV, A.A.; SMIRNOV, Yu.S.; KOLESNIKOV, A.Ye.; DROZDOV, I.P.; IVANTSOV, O.M.; TSYGANOV, B.Ya.; KORNONOGOV, A.P.; VDOVIN, K.I.; ALEKSEYEV, L.A.; GAYDUKOV, D.T.; LIPOVETSKIY, A.Ya.; DANYUSHEVSKIY, V.S.; VEDISHCHEV, I.A.; ALEKSEYEV, L.G.; KRASYUK, A.D.; IVANOV, G.A.

Author's communications. Neft. i gaz. prom. no.2:67-68 Ap-Je '64. (MIRA 17:9)

SMIRNOV, Yu.S., inzh.; ROGACHEVSKIY, L.I.; FEDOROV, B.S.

System for driving piles on the construction site of the Krivorog State Regional Electric Power Plant No.2. Energ. stroi. no.41:15-23 '64. (MIRA 17:11)

SMIRNOV, Yu.S.; FEDOROV, B.S.

Practices in setting deep bored supports and piles. Osn.,fund. i mekh. grun. 6 no.6:15-18 '64. (MIRA 18:1)

BAGDASAROV, Sh.B.; SMIRNOV, Yu.T.

Studying the drillability of rocks when drilling horizontal test holes in the Udokan deposit. Trudy MGRI 34:31-39 '59. (MIRA 13:12)

(Udokan Range--Boring)

TIKHONOV, N.V.; SMIRNOV, Yu.T.

Increasing the efficiency of PML-5 loading machines. Trudy MGRI 34:40-46 '59. (MIRA 13:12)
(Mining machinery)

SMIRNOV, Yu.T.

Determining the effective depth of holes in prospecting drilling. (MIRA 15:11)
Uch.zap.SAIGIMS no.5:187-196 '61.
(Boring)

BRUVER, Ye.A.; MISHCHENKO, V.V.; SMIRNOV, Yu.T.

Efficient groups of boreholes in electric rotary drilling in exploratory workings. Uch. zap. SAIGIMSa no.7:233-239 '62. (MIRA 17:2)

1. Sredneaziatskiy nauchno-issledovatel'skiy institut geologii i mineral'nogo syr'ya, Tashkent.

ZIMINOV, N.V.; SMIRNOV, Yu.T.; FAZLULLIN, M.I.

Comparative evaluation of various ways of drilling ventilation holes. Uch. zap. SAIGIMSa no.7:241-248 '62. (MIRA 17:2)

1. Sredneaziatskiy nauchno-issledovatel'skiy institut geologii i mineral'nogo syr'ya, Tashkent i Kanimanskaya geologo-razvedochnaya ekspeditsiya.

CHUMAKOV, I.D.; SMIRNOV, Yu.T.; NAZAROV, L.V.

Efficient types of bottom-hole tips for rotary drilling in hard rocks. (MIRA 17:2)
Uch.zap. SAIGIMSa no.10:100-121 '63.

SMIRNOV, Yu.T.; FAZLULLIN, M.I.

Effect of some technical and economical parameters on the reasonable distance between ventilation holes. Uch.zap. SAIGIMSa no.10:122-132 '63. (MIRA 17:2)

CHUMAKOV, I.D.; SMIRNOV, Yu.T.

Results of studying the quality of sampling the complex ore bodies by horizontal holes. Uch.zap. SAIGIMSa no.10:138-140 '63. (MIRA 17:2)

ZIMINOV, N.V.; SMIRNOV, Yu.T.; FAZLULLIN, M.I.

Results of the study of the ductiness of mine air in prospecting drilling. Izv. vys. ucheb. zav.; geol. i razv. 6 no.5:140-145 My '65. (MIRA 18:10)

1. Srednеaziatskiy institut geologii i mineral'nogo syr'ya (SAIGIMS).

CHUMAKOV, I.D.; MISHCHENKO, V.V.; NAZAROV, L.V.; SMIRNOV, Yu.T.

Results of experimental work on the electric rotary drilling in solid rocks. Biul.nauch.-tekh.inform VIMS no.1:70-73 '63. (MIRA 18:2)

1. Sredneaziatskiy nauchno-issledovatel'skiy institut geologii i mineral'nogo syr'ya, Tashkent.

S/089/61/011/003/010/013
B102/B138

21.4100

AUTHORS: Galkin, N. P., Veryatin, U. D., Smirnov, Yu. V.

TITLE: Thermodynamics of the reduction of uranium tetrafluoride by calcium

PERIODICAL: Atomnaya energiya, v. 11, no. 3, 1961, 257-260

TEXT: The reaction $UF_4 + 2Me = U + 2MeF_2 + Q$ is generally used to obtain metallic uranium fluoride; Me = Mg or Ca. The case Me = Ca is considered here, and results are compared with those relative to reduction by means of Mg. The relation $\log K = -\Delta Z^o_T/4.576\,T$ holds for the equilibrium constant of this reaction. The change in the free energy of the reaction can be determined from the Gibbs-Helmholtz equation:

$$\Delta Z^o_T = \Delta H_o + \int_c^T \Delta C_p dT - T\Delta S_c - T\int_c^T \frac{\Delta C_p}{T} dT.$$

Numerical values for the thermal effect are listed in Table 3. As may be

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Thermodynamics of the reduction...

seen, the thermal effect of the reaction grows rapidly from the boiling point of UF_4 (1417°C) and that of calcium (1690°C). While the thermodynamic calculation yielded 2100°C for the reduction reaction, the measurement showed 2000°C, which is considerably higher than the melting point of the slag (1418°C). This means that sufficient heat is liberated both for the melting and for heating the melt, so that no charge preheating is required when Ca is used for the reduction of UF_4. The free energy, and, hence, also the equilibrium constant of the UF_4 reduction by Ca, diminishes with rising temperature. As may be seen from the data in Table 3, the reaction equilibrium has almost completely moved over to the righthand side of the reaction. Apart from the fact that magnesium is much cheaper, the reduction of UF_4 by calcium offers considerable advantages. There are 1 figure, 3 tables, and 9 references: 6 Soviet and 3 non-Soviet. The three references to English-language publications read as follows: Ref. 5: Metal Ind., 94, no. 7, 127 (1959); Ref. 7: O. Kubaschewski, E. Evans. Metallurgical Thermochemistry. London - New York, Pergamon Press, 1958; Ref. 9: A. Glassner. The Thermochemical Properties

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Thermodynamics of the reduction...

of the Oxides, Fluorides and Chlorides to 2500°K. New York, ANL-5750, 1958.

SUBMITTED: April 27, 1960

Legend to Table 3: (1) Temperature, (2) thermal effect, kcal/mole, (3) free energy, kcal/mole; (4) logarithm of equilibrium constant.

Температура, °К (1)	ΔH^0_T, ккал/моль (2)	ΔZ^0_T, ккал/моль (3)	lg K (4)
298	—137,6	—134,3 (—80,1)*	98,49
500	—137,64	—132,1 (—77,8)	57,72
723	—138,0	—129,6 (—74,1)	39,17
938	—135,7	—126,3 (—70,7)	29,42
1000	—135,5	—125,7 (—69,4)	27,46
1049	—131,1	—125,3 (—68,7)	26,11
1123	—138,3	—124,8 (—67,4)	24,29
1309	—149,8	—122,6 (—64,0)	20,47
1405	—147,0	—120,6 (—60,0)	18,76
1424	—144,7	—120,3 (—59,2)	18,46
1500	—147,3	—118,9 (—54,0)	17,32
1690	—197,3	—114,9 (—44,8)	14,85
1963	—275,0	—101,5	11,30
2000	—274,9	—98,3	10,74
2273	—274,1	—74,2	7,13
2500	—273,5	—54,3	4,74

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SMIRNOV, Yu. V.

"Infinite Dimensional Spaces."

paper submitted at International Congress Mathematicians, Edinburgh, 14- 21 Aug 1958.

LAZARYANTS, E.G.; TSAYLINGOL'D, V.L.; SMIRNOV, Yu.V.; SHIKHALOVA, K.P.; OLADOV, B.N.

Dewatering of synthetic rubbers in screw expeller presses. Kauch. i rez. 22 no.5:13-16 My '63. (MIRA 16:7)

1. Nauchno-issledovatel'skiy institut monomerov dlya sinteticheskogo kauchuka.

(Rubber, Synthetic—Drying)

SMIRNOV, Yu.V.

25(1,5) PHASE I BOOK EXPLOITATION SOV/1969

Muzalevskiy, Oleg Georgiyevich, Candidate of Technical Sciences, and Yuriy Vladimirovich Smirnov, Engineer .

Avtomatizatsiya prokatnykh stanov (Automation of Rolling Mills) Moscow, Trudrezervizdat, 1958. 87 p. (Series: Novaya tekhnika i peredovyye metody truda) 5,000 copies printed.

Ed.: G.A. Demina; Tech. Ed.: Rakov, S.I.; Scientific Ed.: B.S. Tseytlin.

PURPOSE: This pamphlet is intended for teachers and foremen of labor reserve schools. It may also be useful to qualified workers and engineering staff in rolling mills.

COVERAGE: This booklet deals with the operation of automated rolling mills [blooming, small-section, strip and pipe piercing mills, hot and cold sheet rolling mills] and with electrical schemes for automation of mill subassemblies. The authors give information on devices for automated mass production on rolling mills, measurement of sizes of rolled stock, methods of recording temperatures and rolling forces, quality control of the rolled

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stock, and control of the expansion of rolls. Engineer R.V. Lyambakh is co-author of the first and last chapters of the book. There are 14 Soviet references.

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