[illegible], V.

Considerations on the theory of thin elastic plane plates. Studii cerc mec apl 14 no.1: 251-[illegible] '63.

MANEA, V.

Construction of the solution of thin elastic plane sheet equations, in the theory without the Love-Kirchhoff hypothesis, by the analytic function method. Studii cerc mec apl 14 no.5:1145-1161 '63.

MANEA, V.

Vibrations of elastic thin plane plates in the theory without the Love-Kirchhoff hypothesis. Studii cerc mec apl 15 no.2: 305-323 '64.

1. Submitted December 9, 1963.

MANECEK, Milos, MUDr. (prednosta orthopedickeho oddeleni)

Congenital hip dislocation in children in Northern Korea.
Acta chir. orthop. traum. cech. 23 no. 1:2-5 Feb 56 .

1. Z nemocnice Ceskoslovenskeho Cerveneho krize v Condzinu KLDR.
(HIP, dislocations,
congen., nutritional factor & ther. eff. of carrying of child on mother's back in No. Korea (Cz)
(NUTRITION,
nutritional factor in congen. hip disloc. (Cz)
(DISLOCATIONS
hip, congen., nutritional factor & ther. eff. of carrying of child on mother's back in No. Korea (Cz)

KWIECINSKA, Barbara; MANECKI, Andrzej

Petrographic quantitative analysis of grain preparations of coal. Przegl geol 11 no.1:17-20 Ja '63.

1. Katedra Mineralogii i Petrografii, Akademia Gorniczo-Hutnicza, Krakow.

MANECKI, A.

Dickite from Stara Gora in Lower Silesia. Bul geolog PAN 12 no.1:41-48 '64.

1. Department of Mineralogy and Petrography of the School of Mining and Metallurgy, Krakow. Submitted October 11, 1963.

MANEDOV, KH. I.

46 3217. LUMINESCENT COMPONENTS OF PETROLEUM. Manedov, Kh.I. (Zh. eksp. teor. Fiz. (J. exp. theor. Phys., Moscow), 1954, vol. 26, (5), 647, 648; abstr. in Ref. Zh. Khim. (Ref. J. Chem., Moscow), 1955, (18), 41178). The ultra-violet luminescence of Azerbaidzhan crudes was studied. Excitation with light from the 313 mμ line produced luminescence mainly of phenanthrene, which is a component of these crudes. FJ

MANEDOV, R. M.; FEDOROV, B. P.

Syntheses and transformations of some derivatives of 2-(mercaptomethyl) benzimidazole. Izv AN SSSR Ser Khim no. 4: 698-704 Ap '64. (MIRA 17:5)

1. Institut organicheskoy khimii im. N. D. Zelinskogo AN SSSR.

T-4

USSR/Human and Animal Physiology - Blood.

Abs Jour : Ref Zhur - Biol., No 7, 1958, 31621

Author : Alizade, F.M., Manedova, S.A.
Inst : -
Title : Study of the Volume of the Third Fraction of Blood in Donors.

Orig Pub : Azerb, tibb. zh., 1957, No 3, 25-27, 69-70.

Abstract : No abstract.

Card 1/1

MANEGIN, Yu. V.

TETERIN, P.K., kandidat tekhnicheskikh nauk; DANILOV, F.A., inzhener;
MANEGIN, Yu.V., inzhener.

Investigating the oblique rolling process on a three-high stand.
Stal' 17 no.2:147-151 F '57. (MLRA 10:3)

1.TSentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii
i Novotrubnyy zavod.
(Rolling (Metalwork))
(Deformations (Mechanics)) (Pipe, Steel)

MANEGIN, YU. V.

25(1) PHASE I BOOK EXPLOITATION SOV/1878

Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Institut stali

Prokatnoye i trubcprokatnoye proizvodstvo (Rolling and Tube Rolling) Moscow, Metallurgizdat, 1959. 268 p. (Series: Its: Sbornik trudov, vyp. 16) Errata slip inserted. 2,500 copies printed.

Sponsoring Agency: USSR. Gosudarstvennaya planovaya komissiya.

Ed.: B. P. Bakhtinov; Ed. of Publishing House: N. A. Valov; Tech. Ed.: A. I. Karasev.

PURPOSE: This collection of articles may be of interest to scientific workers, process engineers in rolling and tube-rolling plants, and students of metallurgical vtuzes.

COVERAGE: The articles describe work done at the laboratory for metal forming at the Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii (Central Scientific Research Institute of Ferrous Metallurgy). Some theoretical and practical problems of hot and cold rolling of simple and intricate shapes and tubes are considered. Many of the articles discuss results of scientific research carried out under actual operating conditions. K.K. Andreatskiy, A.I. Filatova, V.S. Smirnov, P.T. Yemel'yanenko, A.I. Tselikov, N.D. Lomakin, V.Ya. Ostrenko, D.Ye. Rokhman, O.A. Plyatskovskiy, L.A. Pumichev, Yu.K. Fedorov, and V.N. Shashkov are mentioned as having contributed to this field. There are 57 references: 53 Soviet and 4 German.

TABLE OF CONTENTS:

5

SOV/133-59-9-17/31

AUTHORS: Klyamkin, N.L., Candidate of Technical Sciences, Manegin, Yu.V., Konyushenko, A.T., Golovkin, R.V. and Protopopov, N.N., engineers

TITLE: Mastering of the Production of Tubes by Atomic Hydrogen Welding

PERIODICAL: Stal', 1959, Nr 9, pp 821-827 (USSR)

ABSTRACT: In view of some difficulties in piercing tube billets from some alloy steels and a high consumption of metal in subsequent rolling, the production of tubes from such steels by atomic hydrogen welding of strip should be more economical. After investigations of the process by TsNIIChM and the Moscow Tube Works on an industrial plant for the automatic atomic hydrogen welding of tubes was developed. Conditions of stability of welding arc on the diameter of electrodes and their holders supplying hydrogen - table 1; the dependence of electric parameters of the arc on the rate of the supply of hydrogen and the distance between the centres of electrodes - Fig 3 and 4 respectively. The installation for the production of alloy tube consists of a modified tube forming stand of the type 10 - 60, six arcs automatic welding head with a control panel, welding transformers and a system of power,

Card 1/2

SOV/133-59-9-17/31

Mastering of the Production of Tubes by Atomic Hydrogen Welding

gas and water conduits (Fig 5). The welding head - Fig 6; scheme for automatic control - Fig 7. Welding conditions for steels 1Kh18N9, Kh18N11B, EI533 and 50KhFA - Table 2; results of testing of welded tubes - Table 3; macro and microstructure of welded seam - Fig 8 and 9 respectively. The results of testing of welded tubes indicated that their properties correspond to standards for seamless stainless tubes (GOST 5543-50). There are 9 figures and 3 tables.

ASSOCIATIONS: TsNIIChM
Moskovskiy trubnyy zavod (Moscow Tube Works)

Card 2/2

TETERIN, P.K.; MANEGIN, Yu.V.; MUSORINA, I.Ye.; TRIFONOV, Ye.A.

Designing rolls for rolling-off and grooving mills used in diagonal rolling. Sbor.trud.TSNIICHM no.16:215-226 '59. (MIRA 12:5)

(Rolling (Metalwork))

TETERIN, P.K.; MANEGIN, Yu.V.; BUROV, A.S.

Pressure of metal on rolls during the rolling on Pilger mills.
Sbor.trud.TSNIICHM no.16:227-240 '59. (MIRA 12:5)
(Rolling (Metalwork))

L 4404-66 EWP(e)/EWT(m)/T/EWP(t)/EWP(k)/EWP(z)/EWP(b)/EWA(c) IJP(c) JD/HW/MJW(CL)

ACC NR: AT5022896 SOURCE CODE: UR/2776/65/000/043/0131/0134

59 B+1

AUTHOR: Karpman, G. M.; 44,55 Manegin, Yu. V. 44,55

ORG: Central Scientific-Research Institute of Ferrous Metallurgy 44,55 (Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii, Moscow)

TITLE: Extrusion 44,55 of dispersion-strengthened nickel bars 14 27,44,55

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov, no. 43, 1965. Poroshkovaya metallurgiya (Powder metallurgy), 131-134

TOPIC TAGS: powder metallurgy, 4,44,55 nickel, nickel alloy, dispersion strengthened alloy, aluminum oxide containing alloy, chromium oxide containing alloy, titanium oxide containing alloy, zirconium oxide containing alloy, sintered alloy, alloy bar, alloy extrusion

ABSTRACT: The extrusion of bars from nickel strengthened with up to 7% dispersed aluminum, 27 titanium, 27 zirconium, 27 or chromium 27 oxides 27 has been investigated. Nickel and oxide powder mixtures were cold compacted and then sintered at 1050C for 5 hr in a hydrogen atmosphere. The sintered compacts of pure nickel had the maximum density, 90%, and those of nickel with 7% Al_2O_3 the lowest density, 55%. The compacts were machined into billets 61 mm in diameter and 150 mm long, heated in hydrogen to 1020 to 1080C, and extruded into bars 20 mm in diameter (90% reduction) with a glass lubricant. The extruded bars had a smooth surface, even in case of the 7% Al_2O_3 bars, which were the most difficult to extrude. The extrusion force required increased

Card 1/2

L 4404-66

ACC NR: AT5022896

with increasing oxide content. For instance, pure Ni required a specific pressure of 42.4 kg/mm^2 compared to 105 kg/mm^2 for Ni with 7% Al_2O_3. Alloys with 5—7% titanium, chromium, or zirconium oxides required a specific pressure of 65—75 kg/mm^2. Extrusion increases the density of alloys. Alloy bars containing 1—3% oxides had a density close to the theoretical. At a higher oxide content, the porosity increased to 5%. Orig. art. has: 3 figures and 2 tables. [WW]

SUB CODE: MM/ SUBM DATE: none/ ORIG REF: 000/ OTH REF: 000/ ATD PRESS: 4125

Card 2/2

L 3988-66 EWT(d)/EWP(e)/EWT(m)/EPF(c)/EWP(v)/T/EWP(t)/EWP(k)/EWP(h)/EWP(z)/EWP(b) ~~EWP(l)/EWA(c) IJP(c)~~ MJW/JD/HW/JG/DJ

ACC NR: AT5022901 UR/2776/65/000/043/0157/0163

72
69
B+1

AUTHOR: Manegin, Yu. V. 44,55

TITLE: Hot extrusion of tubes from sintered-molybdenum billets 44,55,18 27 44,55 27

SOURCE: Moscow. Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii. Sbornik trudov, no. 43, 1965. Poroshkovaya metallurgiya (Powder metallurgy), 157-163

TOPIC TAGS: tube, molybdenum tube, molybdenum, sintered molybdenum, tube extrusion, hot extrusion, tube rolling, warm rolling 4

ABSTRACT: Experiments have been conducted to establish optimal conditions for the extrusion of hollow, sintered-molybdenum tube billets and for the extrusion of billets into tubes. TsSDM molybdenum powder was compacted hydrostatically under 88.3 Mn/m^2 pressure into hollow billets, which were sintered at 1800C. The billets were then extruded at about 1400C with a glass lubricant into shells 78 mm in diameter, with 25.5-mm thick walls and a 53% reduction. The shells were machined to a diameter of 73 mm and hot extruded into tubes 40—42.7 mm in diameter with 7—8.35-mm thick walls and a reduction of 75—79.7%. Extruded tubes had a satisfactory surface quality inside and outside; no cracks or porosity were observed. Extruded tubes were successfully warm rolled at 500—600C on the KhPT-32 mill into tubes 25 mm in diameter with 2.5-mm thick walls. The process developed has many advantages compared to

Card 1/2

L 3988-66

ACC NR: AT5022901

3

the one previously used, in which the cast billets had to be bored and machined. Orig. art. has: 8 figures and 2 tables. [ND]

ASSOCIATION: Tsentral'nyy nauchno-issledovatel'skiy institut chernoy metallurgii, Moscow (Central Scientific Research Institute of Ferrous Metallurgy)

44,5

SUBMITTED: 00 ENCL: 00 SUB CODE: MM, IE

NO REF SOV: 005 OTHER: 000 ATD PRESS: 4120

BC

Card 2/2

ACC NR: AP7002438 (N) SOURCE CODE: UR/0219/66/000/012/0044/0048

AUTHOR: Manegin, Yu. V.

ORG: TsNIIChERMET

TITLE: Microstructure and mechanical properties of extruded TsM2A molybdenum alloy

SOURCE: Metallovedeniye i termicheskaya obrabotka metallov, no. 12, 1966, 44-48 and insert facing page 33

TOPIC TAGS: molybdenum alloy, temperature dependence, tensile strength, metal extrusion, metal grain structure, metal recrystallization / TsM2A molybdenum alloy

ABSTRACT:

TsM2A molybdenum alloy ingots (0.07—0.3% titanium, 0.07—0.15 Zr, impurities not exceeding: 0.003% oxygen, 0.005% nitrogen, 0.001% hydrogen, and 0.004% carbon) 78 mm in diameter were extruded at 1000—1600C into bars 20—45 mm in diameter, i.e., with respective reductions of 94—68%. The grain size of the as-cast alloy was 2 mm and up. In the extruded alloy, the grains became oriented in the direction of deformation and were elongated, with a fibrous structure. Extrusion at 1000—1150C with a reduction of 68% did not eliminate the cast structure. Only extrusion at 1300—1600C with a reduction of 75% eliminated the cast structure completely and reduced the grain size to 0.05—0.15 mm. In alloy extruded at 1600C, a recrystallization was observed.

Card 1/2 UDC: 620.17:620.18:669.28

ACC NR: AP7002438

At a reduction of 81%, recrystallization extended throughout the cross section of extruded bars. Extrusion increased the strength of alloy by 50—100%, compared to the as-cast condition. With increasing extrusion temperature, the strength decreased (see Fig. 1). Alloy extruded at 1150—1300C, at a high tensile strength (100 kg/mm²) had a relatively high ductility (elongation 15%). Orig. art. has: 7 figures.

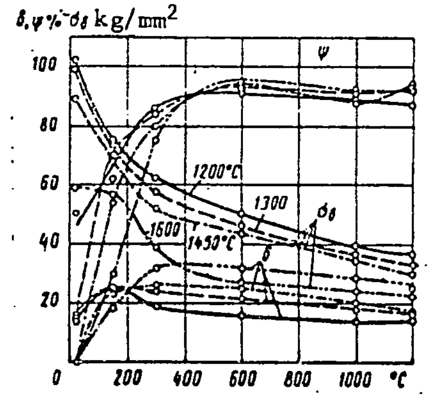

Fig. 1. Temperature dependence of mechanical properties of TsM2A alloy extruded at various temperatures with 94% deformation

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 002/ ATD PRESS: 5113

Card 2/2

MANEGINA, L.A.

Natural conditions in the Azov and Bataysk regions of Rostov Province. Uch. zap. RGU 44:203-209 '59. (MIRA 14:1)
(Rostov Province—Physical geography)

MANEIU, M.

H

COUNTRY : RUMANIA
CATEGORY : Chemical Technology, Chemical Products and Their Applications. Leather. Gelatine. Tanning Materials.*
ABS. JOUR. : RZhKhim., No 17, 1959, No. 63222

AUTHOR : Alexa, G.; Iarosinschi-Drabic, I.; Naga, C.; Ma-**
INSTITUTE : Rumanian Academy
TITLE : Effect of Formaldehyde on the Quantity of Water-Soluble Substances in Leather Tanned With Vege-***
ORIG. PUB. : Studii si cercetari stiint. Acad. RPR, Fil. Iasi. Chim., 1958, 9, No 1, 115-124

ABSTRACT : The treatment with formaldehyde (I) of leather tanned with vegetable tanning agents increases its hydrothermic stability and reduces quantity of water-soluble substances. The use of I converts the unbound tannides into the insoluble form without causing the loss of tanning properties. I reacts with collagen and strengthens the

***table Agents.

**neiu, M.; Strub, C.

*Industrial Proteins.

Card: 1/2

ABSTRACT Con'd : leather-tannide complex. The treatment with I causes tanning cells to increase in size, causes phenolic groups to increase in number which leads to the increased strength of derma and the improved tensile strength limits.

Card: 2/2

H - 168

MANEK, Gy.

"Some Experiences of the Hungarian Bureau of Standards in the Field of Control", P. 132, ([illegible], Vol. 5, No. [illegible], September [illegible], Budapest, Hungary"

SO: Monthly List of East European Accessions ([illegible]), LC, Vol. [illegible], No. [illegible], March 1955, Uncl.

[illegible], Gy.

"Let Us Take Care of Our Agricultural Machinery!", P. 161, ([illegible], Vol. [illegible], No. 10/11, Oct./Nov. 1953, Budapest, Hungary)

SO: Monthly List of East European Accessions (EEAL), LC, Vol. 4, No. 3, March 1955, Uncl.

MANEK, Gyula; CSIKOS-NAGY, Bela

No.8/1962.(Asz.25.) AH order issued jointly by the President, National Board of Prices, and the President, Hungarian Bureau of Standards, on the coordination of decrees on standards and price regulations. Szabvany kozl 14 no.8:169 Ag '62.

1. Magyar Szabvanyugyi Hivatal elnokhelyettese (for Manek).
2. Orszagos Arhivatal elnoke (for Csikos-Nagy).

MANEK, Gyula

No.8/1962.(Sz.K.8.)MSzH order issued by the President, Hungarian Bureau of Standards, on the putting into force, modification, and abrogation of the National Standards of the Hungarian People's Republic. Szabvany kozl 14 no.8:170-175 Ag '62.

1. Magyar Szabvanyugyi Hivatal elnokhelyettese.

MANEK, Gyula

Order No.9/1962.(Sz.K.9)MSZH issued by the President, Hungarian Bureau of Standards, on the putting into force, modification, and abrogation of the National Standards of the Hungarian Peoples, Republic. Szabvany kozl 14 no.9:193-198 S '62.

1. Magyar Szabvanyugyi Hivatal elnokhelyettese.

MANEK, Gyula

Order No.2/1964.(Sz.K.2.) MSZH issued by the President, Hungarian Bureau of Standards, on putting into effect, modification and abrogation of the Hungarian People's Republic National Standards. Szabvany Kozl 16 no. 2:H 17-H 21 F '64.

1. Vice-President, Hungarian Bureau of Standards, Budapest.

MANEK, Gyula

Order No.9/1964 (Sz.K.9) MSZH issued by the President, Hungarian Bureau of Standards, on putting into effect, modification and abrogation of the Hungarian People's Republic National Standards. Szabvany kozl 16 no.9:H 109 - H 110 S '64.

1. Deputy President, Hungarian Bureau of Standards, Budapest.

LOCHMAN, K.; MANEK, O.

"Calculation and design of steam generators of atomic power plants" by T.Ch. Margulova [Margulova, T.Kh.]. Reviewed by K. Lochman, O. Manek. Jaderna energie 9 no.7:244 Jl '63.

[redacted]

MANEKIN, Ye., polkovnik zapasa

They were the first to be hit. Voen. znan. 39 no.6:6-7 Je '63. (MIRA 16:8)

(World War, 1939-1945--Campaigns)

MANELIS, G.B.

12216 (Russian.) Problem of Preparing Pure Boron Fluoride. K voprosu o poluchenii chistogo ftoristogo bora. M. I. Vinnik, G. B. Manelis, R. S. Riabova, G. D. Tantsyrev, and N. M. Chirkov. *Zhurnal Neorganicheskoi Khimii*, v. 1, no. 4, 1956, p. 628-631.

Method of preparing KBF_4, and preparing and purifying BF_3. Mass spectral and infra-red analyses.

6
0
6
0

G. B.

27

Distr: 4E4j/4E3d

Acid properties of the BF_3-H_2O system. M. I. Vinnik, G. B. Manelis, and N. M. Chirkov. *Zhur. Neorg. Khim.* 2, 1043-8(1957).—The acid function H_0 of the BF_3-H_2O system for BF_3/H_2O ratios 32.8–99.61 was detd. by the indicator method, 6-bromo-2,4-dinitroaniline, 2,4-dinitroaniline, anthraquinone, and *p*-nitrotoluene being used. $BF_3.H_2O$ acts as a strong acid. For BF_3/H_2O = 99.61, H_0(av.) = 11.4.

J. Rovtar Leach

4

2

;(2) PHASE I BOOK EXPLOITATION SOV/3169

Manelis, G.B.

Priroda kataliticheskoy aktivnosti BF_3 i yego kompleksov; avtoreferat dissertatsii soiskaniye uchenoy stepeni kandidata khimicheskikh nauk (Nature of the Catalytic Activity of BF_3 and its Complex Compounds; Author's Abstract of a Dissertation for the Degree of Candidate of Chemical Sciences) Moscow, 1958. 10 p. 100 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Institut khimicheskoy fiziki.

No contributors mentioned.

PURPOSE: This booklet is intended for chemists studying the catalytic activity of certain aprotic acids used as catalysts.

COVERAGE: The author states that although certain aprotic acids such as boron fluoride (BF_3), aluminum chloride ($AlCl_3$), and titanium tetrachloride ($TiCl_4$) are now widely used in Soviet laboratories and industrial enterprises as catalysts, the mechanism of their catalytic action has not been sufficiently

Card 1/2

Nature of the Catalytic Activity (Cont.) SOV/3169

investigated. As a result, different opinions on their activity exist. While some chemists maintain that these catalysts in combination with a reagent produce coordination compounds having high reactivity, other chemists believe that such an aprotic acid as BF_3 and others need some kind of promotor like water, alcohol, ether, etc. for their catalytic action. The role of these promoters has also not been clarified. Therefore the author devotes his study to reaction kinetics of BF_3 and its coordination compounds. To clarify this problem he describes his experiments in detail and states that the dimerization of isobutylene in presence of complex boron fluoride compounds with water, ether, etc. has shown that in no case does the reaction pass through the stage of forming BF_3 coordinate compounds with isobutylene. In addition the catalytic activity of $H_2O \cdot BF_3$ has been ascertained quantitatively, Kinetic principles and findings obtained in regard to acidity function indicate that the catalysis of $(C_2H_5)_2O \cdot BF_3$ yields protons to the reagent and that these compounds themselves cannot be regarded as strong aprotic acids. The decomposition kinetics of HCOOH in presence of BF_3 is also investigated. No personalities are mentioned. There are 5 Soviet references. There is no table of contents.

AVAILABLE: Library of Congress

Card 2/2

TM/gmp
2-16-60

20-119-1-26/52

AUTHORS: Vinnik, M. I., Manelis, G. B., Epple, G. V., Chirkov, N. M.

TITLE: Kinetics of Isobutylene Polymerization in the Presence of Boron Fluoride Etherate (Kinetika polimerizatsii izobutilena v prisutstvii efirata ftoristogo bora)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958, Vol. 119, Nr 1, pp. 98-100 (USSR)

ABSTRACT: The present paper investigates the polymerization of iC_4H_8 in the presence of a complex compound of the diethyl ether with boron fluoride: $(C_2H_5)_2O.BF_3$. The catalyst $(C_2H_5)_2O.BF_3$ in the form of a thin adsorbed film was applied to the surface of little tubes of melted quartz for the purpose of avoiding diffusion-conditioned disturbances. The reaction container with an insertion of little quartz tubes was evacuated to a pressure of from 10^{-4} - 10^{-5} mm of mercury column previous to the experiment. At first the necessary pressure of ether vapor was produced in the reaction container and then the boron fluoride was introduced. In every experiment the pressures of etherate ($p^g_{etherate}$) of boron fluoride ($p^g_{BF_3}$), of ether in the gaseous phase (p^g_{ether}), corresponding

Card 1/3

20-119-1-26/52

Kinetics of Isobutylene Polymerization in the Presence of Boron Fluoride Etherate

to the equilibrium and the quantity of the etherate($P^{fl}_{etherate}$) condensed on the surface were determined. The data used for the determination of these values are given in brief. Special attention was paid to the production of the pure reagents which must not contain any traces of moisture. The reaction velocity was expressed by the reduction of the isobutylene pressure referring to 1 mole of the adsorbed etherate. A diagram shows the kinetic curve and its anamorphosis for the polymerization process of iC_4H_8 in the presence of the etherate $(C_2H_5)_2O.BF_3$. If $t \geq 70^\circ C$ and $P_{iC_4H_8}$ is small (up to 100 - 1500 mm of mercury column), the kinetic equation up to a 40 - 50 per cent transformation can easily be expressed by a secondary order equation. The constant of velocity K_1 thus determined does not depend on the initial pressure of the iC_4H_8. The influence of ether on the catalytic activity of the $(C_2H_5)_2O.BF_3$ is similar to the influence of water on the acidity of mineral acids (phosphoric acid, sulfuric acid etc.). Such an intense influence of the ether - even at low concentrations - can only be explained by its

Card 2/3

Kinetics of Isobutylene Polymerization in the Presence of Boron Fluoride Etherate 20-119-1-26/52

basic properties. A diagram and a table illustrate the dependence of the constant K_1 of the polymerization velocity on the pressure of boron fluoride in gaseous phase corresponding to the equilibrium. The etherate of boron fluoride is an effective catalyst for the polymerization of iC_4H_8. Judging from the catalytic activity the etherate must have the properties of an intense acid. There are 3 figures, 1 table, and 7 references, 3 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute for Chemical Physics AS USSR)

PRESENTED: August 7, 1957, by V. N. Kondrat'yev, Member, Academy of Sciences, USSR

SUBMITTED: August 1, 1957

Card 3/3

2(1), 5(4) SOV/20-121-4-26/54

AUTHORS: Dubovitskiy, F. I., Manelis, G. B., Merzhanov, A. G.

TITLE: The Formal-Kinetic Laws of the Thermal Decomposition of Explosive Substances in the Liquid Phase (Formal'no-kineticheskiye zakonomernosti termicheskogo razlozheniya vzryvchatykh veshchestv v zhidkoy faze)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol 121, Nr 4, pp 668-670 (USSR)

ABSTRACT: The investigation discussed in this paper takes into account also the variation of volume. In the overwhelming majority of cases the volume practically does not vary if two or more components are interchanged. In the first approximation it may therefore be assumed that the volume of the condensed phase is an additive function of the volumes of the non-reacted substance and of the condensed remainder. The volume of the liquid phase may be considered to be a linear function of the "degree of conversion" (glubina prevrashcheniya). If the volume is variable, the reaction of the n^{th} order satisfies the equation

Card 1/3

SOV/20-121-4-26/54

The Formal-Kinetic Laws of the Thermal Decomposition of Explosive Substances in the Liquid Phase

$d\eta/dt = k - (1-\eta)^n/(1-\mu\eta)^{n-1}$. μ denotes the depth of the variation for a total decomposition. This reaction is reduced to the equation of a simple monomolecular reaction if the variation of the volume by the decomposition is sufficiently high. This implies that the reactions of the first order may proceed according to the monomolecular law and also according to the bimolecular law. Also the taking into account of the volume by the autocatalysis (which is caused by the final condensed products of decomposition) modifies the character of the kinetic curves. This case corresponds to the kinetic equation $d\eta/dt = k_1(1-\eta)+(k_2\alpha(1-\mu)\,\eta(1-\eta))/(1-\mu\eta)$ where α denotes the share of the catalyzer in the condensed remainder. For $\mu = 0$, the last equation is reduced to the classical equation of autocatalysis. A diagram shows the calculated dependence of the reaction velocity on the depth of conversion for various values of μ. The maximal velocity and the corresponding depth of conversion $\eta_{maximum}$ depend in a high degree on the value of μ. A formula for η_{max} is given. The experimental data found by the decomposition of

Card 2/3

SOV/20-121-4-26/54

The Formal-Kinetic Laws of the Thermal Decomposition of Explosive Substances in the Liquid Phase

various substances in the liquid phase may be described sufficiently well by the equations deduced in this paper. There are 3 figures and 3 references, 2 of which are Soviet.

PRESENTED: April 4, 1958, by V. N. Kondrat'yev, Academician

SUBMITTED: March 8, 1958

Card 3/3

5 (4)

AUTHORS: Manelis, G. B., Vinnik, M. I., Chirkov, N. M. (Moscow) SOV/76-33-5-11/33

TITLE: The Acid Function of the System Diethyl Ether - BF_3 (Funktsiya kislotnosti sistemy dietilovyy efir - BF_3)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 5, pp 1030-1034 (USSR)

ABSTRACT: The acid function was investigated over a wide concentration range by using various indicators: 2,4-dinitroaniline, 2,4-dichloro-6-nitroaniline, 5-Cl-2-nitroaniline, and o-nitroaniline. The measurement was carried out by means of the spectrophotometer SF-4 at room temperature. The compound $(C_2H_5)_2OBF_3$ was synthesized in a quartz cuvette. Table 1 shows the dependence of $\lg \frac{C_B}{C_{BH^+}}$ on the concentration of the ether compound for the individual indicators (C_B = concentration of the non-ionized indicator, C_{BH^+} = concentration of the ionized indicator). The determination of the acid function

Card 1/3

The Acid Function of the System Diethyl Ether - BF_3 SOV/76-33-5-11/33

was carried out assuming that the ether compound investigated is a strong acid and that indicators in strong acids have the same value of pK_B (negative logarithm of the basicity constant). Therefore, $pK_B = -4.4$ was put for 2,4-dinitroaniline, and pK_B for the other indicators determined by the usual method. The possible inaccuracies of the determination are discussed. Table 2 and a figure give the results of the determination. The reasons for the deviation of the data obtained from the results mentioned in reference 3 could not be found. Starting from the equilibrium constant the equation of the acid function for $(C_2H_5)_2OBF_3$ in $(C_2H_5)_2O$ is deduced: $H_o = \lg \sqrt{k_1\left(\frac{100}{[AH]} - 1\right) + k_2}$. $(C_2H_5)_2OBF_3$ surpasses the phosphoric acid because of its acidity degree ($H_o = -6.22$ at 100°). The quantitative data of the polymerization rate of isobutylene are in good agreement with it. There are 1 figure, 2 tables, and 7 references, 5 of which are Soviet and 1 Czechoslovakian.

Card 2/3

ASSOCIATION: Akademiya nauk SSSR Institut khimicheskoy fiziki Moskva (Academy of Sciences of the USSR, Institute of Chemical Physics, Moscow)

SUBMITTED: October 9, 1957

5(4), 2(1) SOV/20-126-4-34/62

AUTHORS: Manelis, G. B., Dubovitskiy, F. I.

TITLE: Thermal Decomposition of Explosives Below the Melting Point (Termicheskoye razlozheniye vzryvchatykh veshchestv nizhe temperatury plavleniya)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 126, Nr 4, pp 813-816 (USSR)

ABSTRACT: The present paper deals with various cases of decomposition of solid explosives, thus taking the occurrence of a liquid phase into consideration. Assuming that the solid explosive is soluble in the reaction products and that a thermodynamic equilibrium between solid and liquid phases appears, the ratio a of the concentration $C_{B_{fl}}$ of the initial substance to the concentration $C_{A_{fl}}$ of the reaction products in liquid phase at constant temperature is a constant, which is independent of the progress of the reaction as long as a solid phase is still existent: $a = C_{B_{fl}}/C_{A_{fl}}$. If the decomposition in the solid phase

Card 1/4

SOV/20-126-4-34/62

Thermal Decomposition of Explosives Below the Melting Point

(index f) and in the liquid phase (index fl) are reactions of the first order, the following formula may be derived for the total rate of the reaction:

$- \frac{dB}{dt} = \frac{1}{1-\mu} \frac{dA}{dt} = k_1 C_{B_f} v_f + k_2 C_{B_{fl}} v_{fl} = k_1 B_f + k_2 B_{fl}$, whereby μ holds for the change of volume at complete decomposition:

$\mu = \frac{v_{end} - v_{beginning}}{v_{end}}$, v_f and v_{fl} denote the volumes of the solid and liquid phase, respectively. The connection between the reaction rate and the respective state η of the reaction ($\eta = \frac{B_o - B}{B_o} = \frac{A}{A_o}$) is expressed by the following equation:

$$\frac{d\eta}{dt} = k_1(1-\eta) - k_1 a(1-\mu)\eta + k_2 a(1-\mu)\eta = k_1 + \left[a(1-\mu)(k_2-k_1) - k_1\right]\eta. \qquad (1)$$

If $a(1-\mu)(k_2-k_1)-k_1 = k_m$ is used, this equation is simplified as follows: $\frac{d\eta}{dt} = k_1 + k_m\eta$. (1a) If the condensed products of

Card 2/4

the reaction act as catalysts for the decomposition, the following equation is found for the reaction rate until complete decomposition of the initial substance occurs:

$$\frac{d\eta}{dt} = k_1 + \underbrace{\left[k_2 a(1-\mu) + \frac{k_3 \alpha(1-\mu)a}{1+a} - k_1 a(1-\mu) - k_1\right]}_{= k'_m} \eta \qquad (4)$$

α = share of the catalyst in condensed products. k'_m is only dependent on temperature. Therefore $\frac{d\eta}{dt} = k_1 + k'_m \eta$ (4a) is obtained. This equation is distinguished from equation (1a) only by the value of k_m. The influence of admixtures of chemically inert substances which can increase the decomposition rate of the explosive by converting part of the explosive into liquid form, deserves particular interest. This case occurs when the temperature of the respective eutectic of explosive and admixture is below the experimental temperature. In this case the following equation is found for the reaction rate as a function of η:

SOV/20-126-4-34/62

Thermal Decomposition of Explosives Below the Melting Point

$$\frac{d\eta}{dt} = k_1 + (k_2-k_1)\,\frac{T}{B_o}\,a + \underbrace{\left[(1-\mu)a(k_2-k_1)-k_1\right]}_{k_m}\eta \qquad (6)$$

T... inert admixture

If the solid phase has completely solved in the reaction products, the course of reaction changes in all cases investigated. The connection between the reaction rate and the respective state of reaction (η) was computed according to the equations (1) (for $k_1=1$, $k_2=100$, $\mu=0.9$), (4) (for $k_1=1$, $k_2=20$, $k_3\alpha=100$, $\mu=0.9$), and (6) (for $k_1=1$, $k_2=100$, $\mu=0.9$). The results are graphically described in 3 figures. More complicated cases can occur in real systems conditioned by a more complicated mechanism of chemical decomposition. There are 3 figures and 4 references, 1 of which is Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute for Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: January 16, 1959, by V. N. Kondrat'yev, Academician

SUBMITTED: December 29, 1958

Card 4/4

Manelis G.B

1

PHASE I BOOK EXPLOITATION SOV/3921

Akademiya nauk SSSR. Institut fizicheskoy khimii

Problemy kinetiki i kataliza. [t] 10: Fizika i fiziko-khimiya kataliza (Problems of Kinetics and Catalysis. [vol.] 10: Physics and Physico-Chemistry of Catalysis) Moscow, Izd-vo AN SSSR, 1960. 461 p. Errata slip inserted. 2,600 copies printed.

Eds.: S.Z. Roginskiy, Corresponding Member of the Academy of Sciences USSR, and O.V. Krylov, Candidate of Chemistry; Ed. of Publishing House: A.L. Bankvitser; Tech. Ed.: G.A. Astaf'yeva.

PURPOSE: This collection of articles is addressed to physicists and chemists and to the community of scientists in general interested in recent research on the physics and physical chemistry of catalysis.

COVERAGE: The articles in this collection were read at the conference on the Physics and Physical Chemistry of Catalysis organized by the Otdel khimicheskikh nauk AN SSSR (Section of Chemical Sciences, Academy of Sciences USSR) and by the Academic Council on the problem of "the scientific bases for the selection of catalysts." The Conference was held at the Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry of the AS USSR) in Moscow, March 20-23,1958. Of the great volume of material presented at the conference, only papers not published elsewhere were included in this collection.

III. SOME GENERAL PROBLEMS OF CATALYSIS

IV. ACID - BASE CATALYSIS

25

MANELIS, G.B.

81937
S/062/60/000/06/09/011
B020/B061

11.5000

AUTHORS: Dubovitskiy, F. I., Rubtsov, Yu. I., Barzykin, V. V., Manelis, G. B.

TITLE: Kinetics of the Thermal Decomposition of Dinitroxydiethylnitramine

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 6, pp. 1126-1128

TEXT: The kinetics of the thermal decomposition of dinitroxydiethylnitramine is investigated here by three different methods, the evolution of gas, the change of weight, and the evolution of heat. When studying the kinetics on the basis of the evolution of gas, the same method as earlier (Ref. 5) was used. The curves of the rate of heat evolution are graphically illustrated in Fig. 1, and the temperature dependence of the reaction rate constants in Fig. 2. The values obtained for the reaction heat of the thermal decomposition of dinitroxydiethylnitramine are tabulated. As may be seen from the Table, the thermal effect of the

Card 1/2

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Kinetics of the Thermal Decomposition of Dinitroxydiethylnitramine
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B020/B061

reaction rises slowly with increasing temperature, the temperature rise in the range 150 - 170° being about 6%. The decomposition takes place as a reaction of the first order. The rate constants were experimentally determined, and the activation energy and the factor of the exponential function were calculated. There are 2 figures, 1 table, and 6 references: 2 Soviet, 3 Canadian, and 1 British.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

SUBMITTED: October 6, 1959

Card 2/2

VINNIK, M.I.; MANELIS, G.B.; CHIRKOV, N.M.

Catalytic properties of complex compounds of boron fluoride. Probl. kin. i kat. 10:285-290 '60. (MIRA 14:5)

1. Institut khimicheskoy fiziki AN SSSR.
(Boron fluoride)

84850

S/062/60/000/010/003/018
B015/B064

11.8200
11.1260

AUTHORS: Dubovitskiy, F. I., Rubtsov, Yu. I., and Manelis, G. B.

TITLE: Kinetics of Heat Evolution in the Thermal Decomposition of Tetryl

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1960, No. 10, pp. 1763-1766

TEXT: Since there are no experimental data available on the amount of heat resulting from thermal decomposition of explosives, as well as on the kinetics of heat evolution during the decomposition, the authors investigated the kinetics of heat evolution in the thermal decomposition of tetryl with a differential self-regulating calorimeter (Ref. 1). The determinations were made for the temperature range 130°-155°C, with the weighed portion being such as to permit the decomposition to be regarded as isothermal. As is shown by the curves (Fig. 1) representing the rate of heat evolution, the tetryl decomposition has a self-accelerating character. Table 1 gives the amounts of heat resulting from thermal

Card 1/2

84850

Kinetics of Heat Evolution in the Thermal Decomposition of Tetryl

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B015/B064

decomposition for the temperature range investigated; the mean value is 341 cal/g. The reaction kinetics of tetryl decomposition is described by an equation (2) of autocatalysis of the first order which takes account of the volume change occurring in the course of the reaction. The kinetic constants (Table 2) were determined from equation (2), and the values of the activation energies and the factors of the exponential functions from the temperature function of the rate constants. The kinetic constants obtained from heat evolution, on the one hand, and the weight loss, on the other, were found to be the same. There are 3 figures, 2 tables, and 4 references: 3 Soviet and 1 British.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

SUBMITTED: June 6, 1959

Card 2/2

MANELIS, G. B.

81867

S/020/60/133/02/42/06c
B004/B064

11.1000

AUTHORS: Manelis, G. B., Merzhanov, A. G., Dubovitskiy, F. I.

TITLE: On the Problem of the Mechanism of Powder Burning /

11

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 133, No. 2, pp. 399 - 400

TEXT: Proceeding from experiments conducted by P. F. Pokhil (Ref. 1) the authors investigated whether the burning of dispersed powder particles occurs in the hot flame zone near the maximum temperature, or whether its decomposition occurs already on the surface of the powder. For this purpose an isothermal estimation of the lifetime t_{life} of a particle is carried out. It was assumed that the decomposition of the particles starts at T_{surf} of the surface. Equations are written down for the burning rate u, for t_{life}, and for x_{disp}, the path of the dispersed particles. T_{surf}, t_{life}, x_{disp} were calculated on the basis of the experimentally found values for u, and x_{disp} compared with the

Card 1/2

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81867

On the Problem of the Mechanism of Powder Burning S/020/60/133/02/42/068
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experimental value x_{gas} of the breadth of the dark zone in front of the flame. The data for pyroxiline powder is given in Table 1. The following conclusions are drawn: An exothermal decomposition occurs in the condensed phase, causing the dispersion of a considerable part of the powder. The decomposition of the dispersed particles occurs close to the surface of the burning powder with 300 cal/g and more being released. The final reaction occurs with the formation of the final products, and release of the rest of the heat in the zone of maximum temperature. There are 1 table and 6 references: 4 Soviet and 2 American.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: March 2, 1960, by V. N. Dondrat'yev, Academician

SUBMITTED: February 27, 1960

Card 2/2

89572

S/076/61/035/002/006/015
B124/B201

11.8200

AUTHORS: Dubovitskiy, F. I., Strunin, V. A., Manelis, G. B., and Merzhanov, A. G.

TITLE: Thermal decomposition of tetryl at varying m/V values

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 2, 1961, 306-313

TEXT: A. Lukin and S. Z. Roginskiy (Ref. 5: Acta chem.-phys. USSR, 2, 8, 1935) found a critical ratio to exist between the weight m and the volume V of the reaction vessel in tetryl (2,4,6-trinitro phenyl methyl nitramine), in which the slow decomposition passes over into an explosion under the promoting action of various additions (NO_2 et al.). An extensive study has been made of the kinetic rules governing the isothermal decomposition of molten tetryl as a function of the m/V ratio. The reaction concerned was examined in a device made from stainless steel, as diagrammatically shown in Fig. 1. The pressure rise was measured with the aid of a thin membrane made of stainless steel to which tensometer 5 was fastened. The change of resistance of 5 was determined by a ГПЗ-2 (GPZ-2)

Card 1/12

89572

galvanometer inserted into the diagonal of the bridge. The measurement was made by the compensation principle. The membrane was brought back to zero position by introducing nitrogen from bomb 6 into the compensator. The pressure rise was measured at given time intervals with the pressure gauges 7 and 8 connected to the compensator. Also a strain gauge was fastened onto the membrane, to serve as second arm of the bridge and for a compensation of temperature fluctuations. The clamp 4 (Fig. 2) was pressed onto sealings made of fluorine-containing synthetic material 3 between flanges 1 and 5, the tubes from the strain gauge were via tube 6 connected to the outer arms of the bridge. The minimum measurable pressure is 0.1 mm Hg, the reading accuracy on the mercury manometer ± 0.2 mm Hg. The gaseous products were analyzed for NO_2, NO, N_2O, CO, and CO_2. Samples were taken by means of traps 9 and 10 (Fig. 1) and cuvette 11. The kinetic curves of gas evolution at 150°C (Fig. 3) and 160°C (Fig. 4) in the coordinates: conversion degree η - time at various m/V values are given. The m/V maximum was about 44 times as large as the corresponding minimum; the maximum end pressure of the decomposition products was about 6000 mm Hg. The curves show that the reaction kinetics is practically independent of the mass of the substance, and that the decomposition

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Thermal decomposition of tetryl...

rate increases at all temperatures with rising m/V. The percent content of NO_2, NO, and condensation products drops with increasing decomposition, while the percentage of CO_2 and N_2 increases somewhat toward the end of the reaction, and the CO content remains practically unchanged (Table 1). The change in the number of NO_2 and NO moles per mole of tetryl as a function of the conversion degree for various m/V at 150°C is given; k_1 is the constant of the monomolecular reaction, k_2' that of the autocatalytic reaction, and k_3 is a constant depending on m/V, in which connection $d\eta/dt = k_1(1-\eta) + k_2'\eta(1-\eta) + k_3\eta(1-\eta) = k_1(1-\eta) + k_2(1-\eta)$, where $k_2 = k_2' + k_3$. The dependence of k_1 on m/V is shown in Fig. 7. The initial acceleration of the reaction is correlated with the course of the macroscopic stage of the reaction, which leads to the formation of a highly volatile product with a catalytic action. This process is inhibited after some time by the tetryl decomposition. The further acceleration does not depend on the volume of the reaction vessel, which is indicative of an autocatalysis by the final condensation products

Card 3/12

89572
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B124/B201

Thermal decomposition of tetryl...

(picric acid according to Hinshelwood). The effective values of the activation energy and of the factor of the exponential function in the Arrhenius equation were calculated from the rate constants (Table 3), the values obtained for k_1 being characteristic of the monomolecular decomposition, whereas an activation energy of 37 kcal/mole was found for k_2 with all m/V. The explanation offered by the authors fits the respective hypothesis by N. M. Emanuel' (Ref. 10: Makroskopicheskiye stadii, osobaya rol' nachal'nogo perioda i mekhanizm deystviya ingibitorov i polozhitel'nykh katalizatorov v tsepnykh reaktsiyakh (Macroscopic stages, special role of the initial period and mechanism of the action of inhibitors and positive catalysts in chain reactions); Collection: "Voprosy khimicheskoy kinetiki, kataliza i reaktsionnoy sposobnosti" ("Problems of chemical kinetics, catalysis and reactivity"), Moscow, 1955, p. 117) on the significant role of the initial initiating stage. There are 9 figures, 3 tables, and 10 references: 4 Soviet-bloc and 6 non-Soviet-bloc. The references to the English language publications read as follows: M. A. Cook, M. J. Abegg, Industr.a.Engng. Chem. 48,1090,1956.

Card 4/12

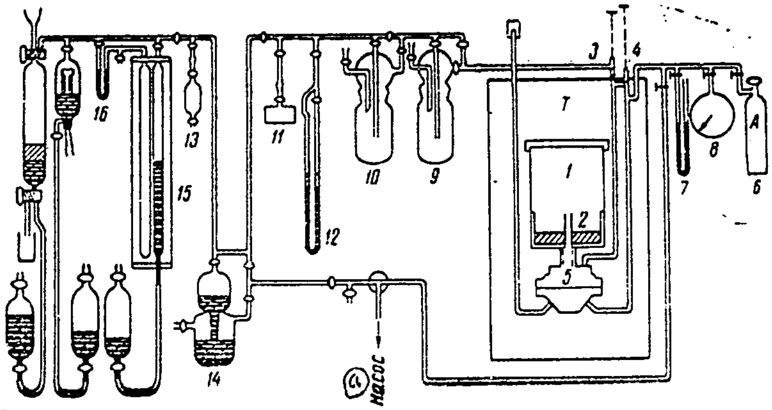
89572

Thermal decomposition of tetryl...

S/076/61/035/002/006/015
B124/B201

ASSOCIATION: Akademiya nauk SSSR, Institut khimicheskoy fiziki (Academy of Sciences USSR, Institute of Chemical Physics)

SUBMITTED: May 21, 1959



Legend to Fig. 1: Overall diagram of the device. a) pump.

Card 5/ 12'

S/076/61/035/003/004/023
B121/B203

11.2216

AUTHORS: Dubovitskiy, F. I., Manelis, G. B., and Smirnov, L. P.

TITLE: Kinetics of thermal decomposition of trinitrophenyl methyl nitramine (tetryl)

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 3, 1961, 521-529

TEXT: The authors studied the kinetics of thermal decomposition of trinitrophenyl methyl nitramine (tetryl) with exact analysis of the decomposition products. They recorded the kinetic curves for the gas generation occurring in the decomposition of tetryl at temperatures between 140.3 and 164.9°C. The nitric oxide content in the gaseous phase increases slightly at the beginning of decomposition, and then remains constant. The carbon monoxide and carbon dioxide contents increase at the end of the reaction. An increase in the reaction temperature increases the nitric oxide and nitrogen dioxide contents. The kinetic curves for the accumulation of N_2, CO, CO_2, and NO are S-shaped. An analysis of the condensed decomposition products of tetryl shows that the condensed phase contains, besides picric acid, considerable amounts of 2, 4, 6-trinitro-anisole and N-methyl-2, 4, 6-tri-

X

Card 1/3

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B121/B203

Kinetics of ...

nitro-aniline. A chromatographic method was developed for the quantitative determination of condensed products. The products were applied to silica gel dyed with rhodamine-6-Zh. The separately isolated products were spectroscopically investigated in alcoholic solution in the ultraviolet spectral range. To distinguish 2, 4, 6-trinitro-aniline from its N-alkyl derivatives, the infrared spectra were also taken with an ИКС-11 (IKS-11) spectrophotometer with LiF prism in the range of 2.85-3.2 μ. After the separation, the condensed decomposition products were hydrolyzed to picric acid, the quantitative determination of which was performed with an СФ-4 (SF-4) spectrophotometer. The kinetic curves for the accumulation of 2, 4, 6-trinitro-anisole and picric acid, as well as for the consumption of tetryl, are S-shaped. The formation of N-methyl-2, 4, 6-trinitro-aniline proceeds very rapidly at the beginning of the reaction, and slows down later. An addition of picric acid was found to accelerate the tetryl decomposition, the picric acid acting as a catalyst with acid-basic character. There are 6 figures, 5 tables, and 10 references: 4 Soviet-bloc and 6 non-Soviet-bloc. The four references to English-language publications read as follows: R. C. Farmer, J. Chem. Soc., 117, 1603, 1920; C. N. Hinschelwood, J. Chem. Soc., 119, 721, 1921; E. Lederer, Chromatography, Amsterdam - Houston -

Card 2/3

Kinetics of ...

S/076/61/035/003/004/023
B121/B203

London - New York, 1953, p. 44; W. A. Schroeder, P. E. Wilcox, K. N. Trueblood, A. O. Dekker, Analyt. Chem., 23, 1740, 1951.

ASSOCIATION: Akademiya nauk SSSR Institut khimicheskoy fiziki (Academy of Sciences USSR, Institute of Chemical Physics)

SUBMITTED: May 21, 1959

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Card 3/3

3.060

S/195/62/003/001/001/010
E071/E136

11.2215

AUTHORS: Manelis, G.B., Rubtsov, Yu.I., Smirnov, L.P., and
Dubovitskiy, F.I.

TITLE: Kinetics of thermal decomposition of pyroxilin

PERIODICAL: Kinetika i kataliz, v.3, no.1, 1962, 42-48

TEXT: As the literature data on thermal decomposition of nitrocellulose are contradictory, the authors investigated the kinetics of thermal decomposition of pyroxilin powder within a temperature range of 140-165 °C. The kinetics were studied by three different methods: by the evolution of heat in a double calorimeter (in vacuo and at atmospheric pressure); by changes in weight on an automatic thermal balance in the presence of air; and by gas evolution in a static vacuum apparatus with subsequent analysis of gaseous decomposition products. It was found that thermal decomposition of pyroxilin powder in air as well as in vacuo takes place to a certain depth of decomposition (depending on the temperature) with autocatalysis of the first order; subsequently the process continues as the first order reaction. The heat effect of thermal decomposition is

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Card 1/3

independent of the temperature and is on average about 750 cal/g which amounts to more than 80% of the heat of combustion (about 900 cal/g). On decomposition in vacuo the heat effect decreases to 515 cal/g. In the autocatalysis equation

$$d\eta/dt = k_1(1 - \eta) + k_2\cdot\eta(1 - \eta)$$

which describes well this stage of the reaction, k_1 and k_2 were calculated from experimental data. The temperature dependence of these constants (for heat evolution in air) was found to be:

$$k_1 = 10^{19}\cdot e^{-\frac{47000}{RT}} \ \sec^{-1},$$

$$k_2 = 10^{12}\cdot e^{-\frac{31000}{RT}} \ \sec^{-1}.$$

The main gaseous product in the initial stage of decomposition is NO; with increasing degree of decomposition the percentage of

Card 2/3

CO_2 increases and that of NO decreases, indicating that the initially split NO_2 group reacts quickly with the condensed phase leading to the formation of nitrogen oxide, carboxyl and carbonyl groups. The process of decarboxylation proceeds with a lower velocity than the reaction of formation of NO and develops mainly at the end of decomposition when the destruction of the polymeric chain is well advanced. The catalytic influence of gaseous decomposition products is indicated by the fact that the velocity constant k_2 is lower on removal of the gaseous products than it is in their presence. However, the autocatalysis of thermal decomposition of pyroxilin was also observed on continuous removal of gaseous products, indicating that functional groups (carboxyl, carbonyl, etc.) of the polymeric molecules, formed in the course of the reaction, also have a catalytic influence. There are 6 figures and 3 tables.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR
(Institute of Chemical Physics, AS USSR)

SUBMITTED: April 3, 1961

Card 3/3

X

L 17853-63 EPF(c)/EWP(q)/EWT(m)/BDS AFFTC/RPL Pr-4 MJW/WW/JD
ACCESSION NR: AP3004430 S/0020/63/151/004/0886/0889

69
66

AUTHOR: Rayevskiy, A. V.; Manelis, G. B.

TITLE: Mechanism of ammonium perchlorate decomposition

SOURCE: AN SSSR. Doklady*, v. 151, no. 4, 1963, 886-889

TOPIC TAGS: ammonium perchlorate, decomposition, thermal decomposition, single crystal, rhombic crystal, cubic crystal, decomposition center, decomposition rate, activation energy, catalyst, decomposition catalyst, carbon film, carbon, thermogravimetric analysis, microphotography, motion-picture microphotography, ammonium perchlorate thermal decomposition

ABSTRACT: Microscopic study and thermogravimetric analysis of ammonium perchlorate single crystals heated at 210—272C have been conducted. The thermal decomposition of ammonium perchlorate was microphotographed with an MKU-1 motion-picture camera. Thermogravimetric microanalysis was employed to record decomposition curves. Two different mechanisms of decomposition, depending upon temperature, were shown to exist. Below 236C decomposition was initiated near the surface of the rhombic crystal. Elongated centers of decomposition were formed by the merging of a multitude of nuclei which previously had been in constant

L 17853-63
ACCESSION NR: AP3004430

2

motion parallel to the main diagonal of the rhombus. The rate of growth of the centers in a direction parallel to the main diagonal is about 10 times that in a transverse direction. Decomposition centers on the rectangular side of the crystal are semispherical and grow at about the same rate as those in the transverse direction. The activation energy of decomposition is 31—33 kcal/mol in all directions. The decomposition rate increases with an increase in the ratio of rhombic to rectangular face area. Above the transition temperature from the rhombic to cubic phase (238—240C), spherical centers are formed in the entire bulk of the crystal. Decomposition progresses by the growth and merging of these centers. The activation energy in this case is 17 kcal/mol. Spraying a film of carbon catalyst on the surface at 230C contributed to an increase in the growth rate of centers in the transverse direction without changing the mechanism of decomposition. The mechanism is explained in terms of the trapping of electrons in the conduction band of the ionic lattice and the formation of a pair of uncharged particles, $[NH_4^{\circ}]\cdot[ClO_4^{\circ}]$, which decomposes rapidly. Nuclei observed below the phase-transition temperature seem to be filled with decomposition products. The report was presented by Academician V. N. Kondrat'yev on 18 April 1962. Orig. art. has: 3 figures and 1 table.

L 17853-63
ACCESSION NR: AP3004430

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Physical Chemistry, Academy of Sciences SSSR)

SUBMITTED: 03Apr62	DATE ACQ: 21Aug63	ENCL: 00
SUB CODE: CH, PH	NO REF SOV: 001	OTHER: 008

Card 3/3

L 54739-65 EWG(j)/EWT(m)/EPF(c)/EPF(n)-2/EPR/EWP(j)/EWP(t)/EWP(b) Pc-4/Pr-4
Ps-4/Pu-4 IJP(c) JD/WW/RM

ACCESSION NR: AP5017886 UR/0195/64/005/005/0823/0830

AUTHOR: Boyarchuk, Yu. M.; Buben, N. Ye.; Dubovitskiy, A. V.; Manelis, G. B. 52 51 B

TITLE: Investigation of irradiated ammonium perchlorate by the electron paramagnetic resonance method

SOURCE: Kinetikia i kataliz, v. 5, no. 5, 1964, 823-830

TOPIC TAGS: ionizing irradiation, ammonium salt, perchlorate, electron paramagnetic resonance, radiation chemistry, chemical kinetics

ABSTRACT: The nature, accumulation, and recombination of paramagnetic centers arising under the action of ionizing radiation in pure ammonium perchlorate and in NH_4ClO_4 with additions of CaO, MnO_2 (as mixtures in amounts of 2% by weight), and $KMnO_4$ (cocrystallized with NH_4ClO_4) were studied in the temperature range 150-400°K by the electron paramagnetic resonance method. A correlation was found between the behavior of radicals in irradiated NH_4ClO_4 and thermal decomposition of ammonium perchlorate: NH_3

Card 1/2

L 54739-65
ACCESSION NR: AP5017886

was found to be a good model (observed by the electron paramagnetic resonance method) for investigating typical properties and behavior of active particles formed in thermal reactions. Orig. art. has: 3 figures, 3 formulas, 7 graphs.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics, AN SSSR)

SUBMITTED: 06Oct62 ENCL: 00 SUB CODE: IC, GC

NR REF SOV: 005 OTHER: 004 JPRS

gac
Card 2/2

L 22530-65 EWG(j)/EWT(m)/EPF(c)/EPF(n)-2/EPR/EWP(j)/T/EWP(t)/EWP(b) Pr-4/Pc-4/Ps-4/Pu-4 IJP(c)/RPL RM/WW/JD/JWD

ACCESSION NR: AP5001601 S/0062/64/000/012/2226/2227

AUTHOR: Strunin, V. A.; Manelis, G. B.

TITLE: Effect of pressure on the kinetics of the thermal dissociation of ammonium perchlorate

21

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 12, 1964, 2226-2227

TOPIC TAGS: ammonium perchlorate, thermal dissociation, kinetics

ABSTRACT: The effect of 100 gage atmosphere pressure of an inert gas (nitrogen) on the kinetics of the thermal dissociation of ammonium perchlorate at 230 and 260 C was investigated. At 230 C the final weight loss at the high pressure was about 10% greater than at atmospheric pressure, but the reaction rate constants were practically the same. At 260C the weight losses were essentially the same regardless of pressure. Thus the kinetics of the thermal dissociation reaction of ammonium perchlorate were not changed under the effect of the inert gas pressure. Orig. art. has: 1 table and 4 figures

Card 1/2

L 22530-65
ACCESSION NR: AP5001601

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics Academy of Sciences SSSR)

SUBMITTED: 04May64 ENCL: 00 SUB CODE: GC, GP

NR REF SOV: 001 OTHER: 002

Card 2/2

RUBTSOV, Yu.I.; MANELIS, G.B. (Moskva)

Critical phenomena in liquid-phase autocatalytic reactions.
Zhur. fiz. khim. 38 no.10:2392-2396 O '64.
(MIRA 18:2)

1. Institut khimicheskoy fiziki AN SSSR.

L 8490-66 EWT(m)/EPF(n)-2/EWP(j)/T/EWP(t)/EWP(b)/EWA(h) IJP(c)/RPL
JD/WW/JG/JWD/GG/RM

ACC NR: AP5026472 SOURCE CODE: UR/0195/65/006/005/0828/0835

44,55 44,55 82 79 B

AUTHOR: Dubovitskiy, A.V.; Manelis, G.B.

44,55

ORG: Branch of the Institute of Chemical Physics, AN SSSR (Filial Instituta khimicheskoy fiziki AN SSSR)

7,44,55

TITLE: Radiochemical decomposition of $KClO_4$

SOURCE: Kinetika i kataliz, v. 6, no. 5, 1965, 828-835

TOPIC TAGS: 14 potassium compound, perchlorate, electron paramagnetic resonance, electron radiation, irradiation effect 19

ABSTRACT: The nature and kinetics of accumulation and recombination of paramagnetic centers in $KClO_4$, formed under the influence of 1.6 MEV electrons, were studied at 77 — 450K with the aid of electron paramagnetic resonance spectra using EPR-2 and RE-1301 spectrometers. The EPR method established the presence of the paramagnetic defects ClO_3, ClO_2, and O_3^- in irradiated potassium perchlorate. The reaction of recombination of O_3^- ion radicals and ClO_2 molecules was found to be a reaction of the second order. From the results it was deduced that the process of radiochemical decomposition of potassium perchlorate can be written in the form of the following

Card 1/3 UDC 546.137:542.921.9

L 8490-66

ACC NR: AP5026472

O

qualitative approximation:

$$ClO_4^- \xrightarrow{h\nu} ClO_4^{\cdot -} \rightarrow ClO_4 + \bar{e}; \qquad (1)$$

$$ClO_4 \rightarrow ClO_3 + {}^1/_2 O_2; \qquad (2)$$

$$ClO_3 \rightarrow ClO_2 + {}^1/_2 O_2; \qquad (3)$$

$$ClO_2 + \bar{e} \rightarrow ClO_2^-; \qquad (4)$$

$$2ClO_2 \rightarrow Cl_2 + 2O_2; \qquad (5)$$

$$O_2 + O + \bar{e} \rightarrow O_3^-; \qquad (6)$$

$$K^+ + O_3^- \rightarrow KO_3; \qquad (7)$$

$$2KO_3 \rightarrow K_2O_2 + 2O_2; \qquad (8)$$

$$K_2O_2 + Cl_2 \rightarrow 2KCl + O_2. \qquad (9)$$

Card 2/3

L 8490-66

ACC NR: AP5026472

3

It is suggested that the above scheme describes the processes of both radiative and thermal decomposition of $KVIO_4$. Authors thank N. Ya. Buben for his assistance. Orig. art. has: 6 figures, 2 tables, and 9 formulas.

44,55

SUB CODE: 07, 18 / SUBM DATE: 16APR64 / ORIG REF: 007 / OTH REF: 006

BVK
Card 3/3

GAIYUK, O.S.; RUBTSOV, Yu.I.; MALINOVSKAYA, G.F.; MANELIS, G.B.

Microcalorimeter for studying the kinetics of chemical reactions. Zhur. fiz. khim. 39 no.9:2319-2322 S '65.
(MIRA 18:10)

1. Institut khimicheskoy fiziki AN SSSP.

RAYEVSKIY, A.V.; MANELIS, G.B.; BOLDYREV, V.V.; VOTINOVA, L.A.

Role of dislocations in the thermal decomposition of ammonium perchlorate crystals. Dokl. AN SSSR 160 no.5:1136-1137 F '65.
(MIRA 18:2)

1. Institut khimicheskoy fiziki AN SSSR. Submitted August 3, 1964.

L 60456-65 EEC(b)-2/EPA/EPF(c)/EPR/EPA(s)-2/EWT(l)/EWT(m)/EWA(c)/T Pi-4/
Pr-4/Pt-7/Paa-4 IJP(c) GG/WW/JWD

ACCESSION NR: AP5007573 S/0020/65/160/005/1136/1137 45 44

AUTHOR: Rayevskiy, A. V.; Manelis, G. B.; Boldyrev, V. V.; Votinova, L. A. 6

TITLE: Role of dislocations in the process of thermal decomposition of ammonium perchlorate crystals

SOURCE: AN SSSR. Doklady, v. 160, no. 5, 1965, 1136-1137, and insert facing p. 1135

TOPIC TAGS: ammonium perchlorate crystal, crystal defect, 21 dislocation density, thermal decomposition 27

ABSTRACT: During the thermal decomposition of NH_4ClO_4 crystals, the dislocations were observed by etching the surface of the crystals in 95.5% ethanol and continuously watching it under a microscope (at high magnifications, the etchant itself served as the immersion liquid). It was shown that the etch patterns are not related to surface defects, but to dislocation loops present in the crystal, and that the highest dislocation density arises at the point where the load is applied to the crystal when its plastic deformation is carried out. Polygonization was observed when the crystals were annealed. Crystals which had first been heated up to the decomposition temperature were also etched; the dislocation density was found to be

Card 1/2

L 60456-65
ACCESSION NR: AP5007573

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high around the nucleation center. The great similarity between the anisotropy of the arrangement of dislocations and the anisotropy of the development of the decomposition reaction of NH_4ClO_4, as well as the localization of the nucleation centers near the exits of dislocations to the surface of the crystal, point to the major role which dislocations, as structural defects, can play in the thermal decomposition of ammonium perchlorate.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences, SSSR)

SUBMITTED: 21Jul64 ENCL: 00 SUB CODE: SS, TD

NO REF SOV: 001 OTHER: 000

Card 2/2

L 22341-66 EWT(m)/ETC(f)/EPF(n)-2/EWG(m)/EWP(j)/T/EWP(t)/ETC(m)-6 IJP(c)
ACC NR: AP6013905 DS/JD/WW/JWD/RM SOURCE CODE: UR/0076/66/040/004/0770/0774

AUTHOR: Manelis, G. B.; Rubtsov, Yu. I.

15
B

ORG: Institute of Chemical Physics, Academy of Sciences SSSR (Institut khimicheskoy fiziki Akademii nauk SSSR)

TITLE: The kinetics of thermal decomposition of ammonium perchlorate

SOURCE: Zhurnal fizicheskoy khimii, v. 40, no. 4, 1966, 770-774

TOPIC TAGS: ammonium perchlorate, solid propellant, combustion

ABSTRACT: The kinetics of thermal decomposition of ammonium perchlorate (AP) were studied in the range 196.5—280C. The kinetic constants and the heat of the reaction were determined. Examination of the kinetic curves obtained by gravimetric methods indicates that in the range 200—280C the reaction rate falls off sharply after 30—35% of the starting sample had decomposed; the reaction continues at a relatively low rate. It was also observed that above 236C, AP changes from an orthorhombic to a cubic crystalline modification. The transition is accompanied by a substantial decrease in the reaction rate, since in the cubic crystal lattice the decomposition develops more slowly. The heat of reaction was found to be 348±11 cal/g in glass vessels, and 334±12 cal/g in aluminum vessels. Mass-spectrometric analysis of the decomposition products showed that, in addition to nitrogen oxides, appreciable amounts of free nitrogen are present. Orig. art. has: 2 tables and 5 figures. [VS]

SUB CODE: 21/ SUBM DATE: 09Dec64/ ORIG REF: 004/ OTH REF: 010/ ATD PRESS: 4242
Card 1/1 UDC: 541.124/.128

MANELIS, M.Sh.

Improved design of a filter drum. Khim.mash. no.6:42 N-D '60.
(MIRA 13:11)

(Filters and filtration)

S/032/63/029/002/019/028
B101/B186

AUTHOR: Manelis, R. M.

TITLE: Determination of the strength of ceramic-metal joints

PERIODICAL: Zavodskaya laboratoriya, v. 29, no. 2, 1963, 219 - 221

TEXT: The ratio σ_b/σ_t between the bending strength and tensile strength of joints between electric insulating porcelain М-23 (M-23), high-frequency steatite СК-1 (SK-1), or high-alumina ceramics ГБ-7 (GB-7) and ст.3 (st.3) steel was determined. In preparation for soldering the ceramics to the steel the ceramics were metallized with different pastes in a reducing atmosphere. σ_b was determined by loading the joint between a ceramic and a metal rod, diameter 10 - 11 mm, and from $\sigma_b = 8Pl/\pi D^3$ where P is the breaking load, l is the distance between the supports of the specimen, cm, D is the external diameter of the specimen, cm. Truncated cones of ceramic and steel soldered together at their smaller bases were used to determine σ_t. The diameter of the upper bases was 11.3 mm, the height of the cone was 20 mm, the angle at the peak of the cone was 40°. σ_t was determined on a

Card 1/2

tensile-test machine and calculated according to $\sigma_t = P_t/F_o$ where P_t is the tensile load, kg, and F_o is the initial cross section, cm^2. Furthermore, the mean deviation D_{mean} was calculated for σ_b and σ_t. Results:

material	σ_b, kg/cm^2	D_{mean}, %		σ_t, kg/cm^2	D_{mean}, %		σ_b/σ_t
		+	-		+	-	
M-23	687	23	29	242	15	27	2.84
SK-1	1070	21	14	340	22	18	3.1
GB-7	1480	17	20	600	21	25	2.47

There are 3 figures and 2 tables.

L 23799-66 EWP(e)/EWT(m)/ETC(f)/EWG(m)/EWP(t)/EWP(k) IJP(c) RDW/JD/JG

ACC NR: AP6007252 (A) UR/0363/66/002/002/0291/0298

AUTHOR: Meyerson, G.A.; Manelis, R.M.; Telyukova, T.M.

35
B

ORG: none

TITLE: Special characteristics in the production of objects from lanthanum and yttrium hexaborides by sintering in vacuum

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v.2, no.2, 1966, 291-298

TOPIC TAGS: boride, lanthanum compound, yttrium compound, powder metal sintering

ABSTRACT: Previous literature data indicate that objects made of lanthanum boride sintered in a hydrogen atmosphere have a porosity of up to 8%, and with sintering in vacuum not less than 30%. In the present work, the test samples were made of lanthanum boride and yttrium boride powders, whose chemical composition and physical properties are shown in a table. Results of the pressing operation on these powders are exhibited in a series of curves and tables, as well as in microphotographs. Contrary to previous published literature data, the article demonstrates the possibility of producing mechanically strong and sufficiently dense objects from lanthanum hexaboride (σ_{bend} equal to 960 kg/cm^2) and yttrium hexa-

Card 1/2

UDC: 546.654'271 + 546.641'271

L 23799-66

ACC NR: AP6007252

boride (σ_{bend} equal to 400 kg/cm^2) by sintering previously pressed billets in a vacuum. The porosity of objects made of lanthanum hexaboride is of the order of 18-20 %, and from yttrium hexaboride it is 30%. The objects permit polishing, electric sparking, and ultrasonic treatment without destruction. It was established that, with sintering under identical conditions, samples of lanthanum hexaboride obtained by reduction of lanthanum oxide with boron carbide have slightly less shrinkage and less density and strength than analogous samples made of lanthanum hexaboride produced by reduction of lanthanum oxide with boron. Orig. art. has: 7 figures and 3 tables.

SUB CODE: 11, 13, 07/ SUBM DATE: 07Jul65/ ORIG REF: 007/ OTH REF: 002

Card 2/2

L 32042-66 EWP(e)/ EWT(m)/EWP(t)/ETI IJP(c) JD/JG/AT/WH
(A)

ACC NR: AP6013339 SOURCE CODE: UR/0363/66/002/004/0608/0616

70
B

AUTHOR: Meyerson, G.A.; Zhuravlev, N.N.; Manelis, R.M.; Runov, A.D.; Stepanova, A.A.; Grishina, L.P.; Gramm, N.V.

ORG: Physics Department, Moscow State University im. M.V. Lomonosov (Fizicheskiy fakul'tet, Moskovskiy gosudarstvennyy universitet)

TITLE: Some properties of yttrium borides

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 2, no. 4, 1966, 608-616

TOPIC TAGS: yttrium compound, boride, work function, thermionic emission

ABSTRACT: The thermionic and crystallographic constants of the borides YB_4, YB_6, and YB_{12} were measured, and the behavior of these materials in a vacuum at elevated temperatures was studied. The borides were prepared by the vacuum thermal method by reducing yttrium oxide with boron. YB_4 is indexed in a tetragonal lattice with constants $a = 7.12$, $c = 4.04 \pm 0.05$ Å. YB_6 and YB_{12} are indexed in a cubic lattice with constant $a = 4.102$ and 7.506 ± 0.002 Å, respectively. It was shown that only YB_4 is stable during high-temperature treatment (up to 2750K); YB_6 and YB_{12} decompose to

Card 1/2 UDC: 546.641'271

L 32042-66

ACC NR: AP6013339

form YB_4. The microhardness and strength of the borides decreases in the series $YB_4 \rightarrow YB_6 \rightarrow YB_{12}$. Measurements of the thermionic emission showed that the highest density of the emission current was that of YB_4 (0.284 A/cm^2 at 1890K). Currents of $9.68 \times 10^{-4} - 2.01 \times 10^{-5}$ A/cm^2 can be obtained from YB_6 and YB_{12} on a tantalum substrate at maximum operating temperatures of 1790 and 1730K, respectively. The work function (φ_0) increases from 3.2 to 5.31 to 5.36 in the series $YB_4 \rightarrow YB_6 \rightarrow YB_{12}$. The emissive properties depend substantially on the phase composition of the material. In their emissive properties, the yttrium borides studied are substantially inferior to lanthanum hexaboride. Orig. art. has: 8 fig. and 5 tables.

SUB CODE: 11 / SUBM DATE: 16Jun65 / ORIG REF: 007 / OTH REF: 004

Card 2/2 90

L [illegible]-67 EWT(l)/EWT(m)/EWP(e)/EWP(t)/ETI IJP(c) AT/JD/JG
ACC NR: AP6036383 SOURCE CODE: UR/0109/66/011/011/2098/2100

AUTHOR: Manelis, R. M.; Grishina, L. P.; Runov, A. D.

ORG: none

TITLE: Thermionic emission of some yttrium and gadolinium borides

SOURCE: Radiotekhnika i elektronika, v. 11, no. 11, 1966, 2098-2100

TOPIC TAGS: yttrium compound, gadolinium compound, boride, thermionic emission

ABSTRACT: The thermal emission properties of YB_4, YB_6, YB_{12}, GdB_4, and GdB_6 were investigated in a dismountable continuously evacuated diode provided with a ring-protected anode. The boride samples were deposited on a tantalum strip treated with tantalum powder. The chemical and phase compositions of the compounds were rigorously controlled before and during the measurements, which were performed on at least three samples of each of the borides. The data obtained show that from the point of view of emission properties yttrium and gadolinium borides are markedly inferior to lanthanum hexaboride which, according to the authors' measurements has $j_e = 1.34$ a/cm^2 and $\phi = 2.71$ ev at 1600K, and $j_e = 7.15$ a/cm^2 and $\phi = 2.85$ ev at 1800K. Orig. art. has: 1 table.

SUB CODE: 20/ SUBM DATE: 21Feb66/ ORIG REF: 007/ OTH REF: 004/ ATD PRESS: 5105

Card 1/1

ACC NR: AP6036905 (N) SOURCE CODE: UR/0226/66/000/011/0077/0084

AUTHOR: Manelis, R. M.; Meyerson, G. A.; Zhravlev, N. N.; Telyukova, T. M.; Stepanova, A. A.; Gramm, N. V.

ORG: Moscow Institute of Steel and Alloys (Moskovskiy institut stali i splavov)

TITLE: Some specific features of the synthesis of yttrium and gadolinium borides and some of the boride properties

SOURCE: Poroshkovaya metallurgiya, no. 11, 1966, 77-84

TOPIC TAGS: yttrium boride, gadolinium boride, chemical synthesis, boride, yttrium, gadolinium, porosity, hardness, bending strength

ABSTRACT: Yttrium and gadolinium borides were synthesized from respective oxides with amorphous boron at 1400—2000C in a vacuum of $2—5\cdot10^5$ mm Hg. The reaction $MeO + 2B \rightarrow MeB + BO$ yielded YB_4, YB_5 and YB_{12} yttrium borides and GdB_4 and GdB_6 gadolinium borides. Single-phase YB_6 and YdB_6 hexaborides were obtained at 1700C; at higher temperature they decomposed into tetraborides and boron. Single-phase YB_{12} compound was obtained at 1600—1700; at higher temperatures it decomposed into YB_{602} YB_4 compounds. Yttrium and gadolinium boride powders were then compacted, sintered in vacuum, and tested. The porosity of yttrium-boride specimens was 22—26%, and that of gadolinium-boride specimens was 30—32%. The microhardness and bend strength of YB_4; YB_6, and YB_{12} was 2850 dan/mm^2, and 290 dan/cm^2, 2575 dan/mm^2, and 270 dan/cm^2, and 2500 dan/mm^2, and 165 dan/cm^2, respectively. The microhardness

Card 1/2

ACC NR: AP6036905

and bend strength of GdB_4 and GdB_6 was 1900 dan/mm^2 and 675 dan/mm^2 and 1850 dan/mm^2 and 320 dan/cm^2, respectively. The boride contained almost no impurities. The most oxidation resistant were gadolinium borides and, among yttrium borides, the YB_{12} compounds. Orig. art. has: 5 figures and 6 tables.

SUB CODE: 13, 11/ SUBM DATE: 12Apr66/ ORIG REF: 008/ OTH REF: 003/

Card 2/2

ACC NR: AP7006202

SOURCE CODE: UR/0363/67/003/001/0054/0060

AUTHOR: Manelis, R. M.; Meyerson, G. A.; Grishina, L. P.

ORG: none

TITLE: Thermionic emission of certain gadolinium borides

SOURCE: AN SSSR. Izvestiya. Neorganicheskiye materialy, v. 3, no. 1, 1967, 54-60

TOPIC TAGS: boride, gadolinium compound, thermionic emission

ABSTRACT: The thermionic emission of the single-phase compounds GdB_4 and GdB_6 and two-phase compositions $GdB_4 + Gd_2O_3$ and $GdB_6 + B$ was investigated. The effective work function ϕ_t and temperature dependence $d\phi/dT$ were determined. GdB_4 was found to have the best emissive properties ($j = 0.68$ A/cm^2, $\phi = 3.13$ eV at 1750°K). With GdB_6 on a tantalum substrate, one can record a maximum emission current of only 1.4×10^{-5} A/cm^2, $\phi = 3.41$ eV at a temperature of 1600°K. GdB_4 is more stable than GdB_6; the latter decomposes in a vacuum at high temperatures to form GdB_4 and B. The impurities Gd_2O_3 in GdB_4 and B in GdB_6 markedly decrease their emission per unit surface of the composition. In their emissive properties, the gadolinium borides studied are much inferior to lanthanum hexaboride, which at 1600°K has $j = 1.34$ A/cm^2, $\phi = 2.71$ eV, and at 1800°K $j = 7.15$ A/cm^2, $\phi = 2.85$ eV. The data show that the emissive properties in the series of compounds rare earth metal - boron of the compositions

Card 1/2

UDC: 546.662.271+537.32

ACC NR: AP7006202

studied decline with decreasing M:B ratio in the boride. Orig. art. has: 3 figures, 3 tables and 2 formulas.

SUB CODE: 20/ 07/ SUBM DATE: 18Jan66/ ORIG REF: 011/ OTH REF: 001

Card 2/2

Name: **MANELIS, Z. S.**

Dissertation: The clinics and pathogenesis of primary infectious polyradiculoneuritides

Degree: Cand Med Sci

Defended at ~~Affiliation~~: Sverdlovsk State Medical Inst

Publication ~~Defense~~ Date, Place: 1956, Sverdlovsk

Source: Knizhnaya Letopis', No 45, 1956

MANELIS, Z. S. Cand Med Sci -- (diss) "Clinic and pathogenesis of primary infectious polyradicul~~itis~~oneuritis." Sverdlovsk, 1957. 19 pp. (Sverdlovsk State Med Inst.) 100 copies.

(KL, 8-58, 108)

MANELIS, Z.S.

Clinical symptomatology and variations in the course of primary infectious polyradiculoneuritis and encephalomyelopolyradiculoneuritis. Zhur. nevr.i psikh. 60 no.10:1273-1275 '60. (MIRA 14:1)

1. Klinika nervnykh bolezney i neyrokhirurgii (zav. - prof. D.G. Shefer) Sverdlovskogo meditsinskogo instituta i Instituta kurortologii i fizioterapii.
(NEURITIS, MULTIPLE) (ENCEPHALOMYELITIS)

MANEN, J.D. van, dr. ir.; LAMMEREN, W.P.A. van, prof. dr. ir.

Design of the screws adapted to the flow, and their action behind the hull. Brodogradnja 6 no.4:182-188 '55.

MANEN, J.D., van, dr. ing.; SENTIC, A., inz.

Counterrotating propellers. Brodogradnja 8 no.1:1-15
'57.