

PETROV, YU G

24 6600

5/64/01/004/001/11/11  
B104/B100

AUTHORS:

Istrikhak, K. A., Tolmachev, G. M., Gshatskiy, V. A.,  
Y. A., Blinova, M. I., Burorokov, S. S., Moskhatkova, E. I.,  
Chirva, V. B., Petrov, Yu. G., Serkina, A. V.,  
Chernyayeva, L. I., Shiryayeva, L. B.

TITLE:

Yields of some fragments in the fission of  $U^{235}$  and  $U^{238}$  by fission neutrons

SOURCE:

Krupchitskiy, F. A., ed. Neytronnaya fizika, sterizh stroye.  
Moscow, 1961, 217-223

TEXT The authors determined the yield of  $Sr^{89}$ ,  $Zr^{95}$ ,  $Mo^{99}$ ,  $Ag^{107}$ ,  $Sn^{115}$ , and  $Ba^{140}$  in the fission of  $U^{235}$ ,  $U^{238}$ , and  $Pu^{239}$  by fission neutrons. A  $U^{235}$ -enriched uranium plate arranged in the thermal column of a heavy water reactor of the AS USSR served as neutron source. 300-mg tablets and 100 targets were produced from each substance to be fissioned. The fission events were recorded in a fission chamber during the entire irradiation period (Fig. 1). The fission fragment yields were determined from their  
Card 1/1



PETROV, Yu.I.; KIRULIOW, I.I.

Equilibrium in the reaction of nitrogen oxides . . . . .  
Izv.vys.ucheb.zav. / Khim. tekhn. 8 no. 22:5-7, 1965.

I. Ivanovskiy khimiko-tekhnicheskii institut, kafedra tekhnologiy  
neorganicheskikh elementov. (MIRA 18:8)

5(2,3)  
AUTHORS:

Balandin, A.A., Academician,  
Klabunovskiy, Ye.I., Petrov, Yu.I.

SOV/20-127-3-21/71

TITLE:

Configuration Interrelations in Stereospecific Catalysis

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 3,  
pp 557 - 560 (USSR)

ABSTRACT:

The multiplet theory of catalysis shows the existence of a certain structural homology between the reacting molecule and the fine structure of the catalyst surface. These relations were investigated by several examples of the heterogeneous catalysis (Refs 1-3). Henceforth they have to be investigated in the field of asymmetric micro-heterogeneous catalysis, since the principles of the structural and energy correspondence of the multiplet theory was also applied to fermentative catalysis (Ref 4-5). The effectivity of the stereospecific catalysis depends on the degree of the structural correspondence. Therefore it is of interest to enlarge the knowledge about reactions catalyzed by micro-heterogeneous asymmetric catalysts

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Configuration Interrelations in Stereospecific Catalysis SOV, 20-12-1971

(ferment samples). Skita catalyst (colloidal platinum or palladium with gum arabic as protective colloid) was used as such (Ref 7). These catalysts were produced according to reference 9 which was altered according to reference 10. Phenyl- and *o*-naphthyl- glyoxylic acids were chosen as initial compounds which develop oxy-acids with a considerable optic activity **namely:** mandelic acid and *o*-naphthylglycollic acid. These turn in opposite direction, but belong to the same configuration series. Figure 1 shows kinetic curves of the hydrogenation phenyl-glyoxylic acid and the dioxime in coordinates: reaction rate versus time and rate versus - degree of transformation. Table 1 shows results of characteristic experiments with regard to the optical activity. The comparatively high value of the optical activity of the developed diamine is striking. The results obtained show certain configuration interrelations between the catalyst and the reacting molecules. In the cases investigated the protective colloid (gum arabic) does not seem to act as asymmetric carrier, nor as optically active solvent. The asymmetric carrier chosen by the authors has a selective effect during catalysis, since it favors the

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Configuration Interrelations in Stereospecific Catalysis SOV/20-127-3-21/71

development of an acid with a D-configuration. The above results prove a great configuration correspondence between the asymmetric catalyst (rather the asymmetric carrier) and the spatial structure of the reacting molecule (Ref 13). Special experiments proved that the protective colloid also acts as asymmetric carrier (also Ref 2). The results obtained finally prove that the metal particle is not in the solvate cover of the micelle, but immediately contacts the asymmetric molecule of the protective colloid. The course of an asymmetric adsorption and of such a catalysis thus become possible. There are 1 figure, 1 table, and 13 references, 11 of which are Soviet.

ASSOCIATION: Institut organicheskoy khimii im. N.D. Zelinskogo Akademii nauk SSSR  
(Institute for Organic Chemistry imeni N.D. Zelinskiy of the Academy of Sciences, USSR)

SUBMITTED: May 18, 1959

Card 3/3

PETROV, Yu.I.; PETROV, Ye.I.

Effect of shock waves on the wear and tear of knitting  
needle hooks. Tekst.prom. 20 no.5:39-43 My '60.  
(MIRA 13:8)  
(Knitting machines) (Strains and stresses)

KLADUNOV, KIY, Ye.I.; BALANDIN, A.A., akademik, PETROV, Yu.I.

Hydrogenation of  $\alpha$ -keto acids over a colloidal palladium catalyst.  
Dokl. AN SSSR 139 no.2:377-380 J1 '61. (MIRA 14:7)

1. Institut organicheskoy khimii im N.D. Zelinskogo AN SSSR.  
(Acids, Organic) (Hydrogenation)



L 60455-65  
 Pu-4 IJP(c) EPF(n)-2/EPR/EWT(m)/EWP(1)/EWG(m)/EMP(b)/EMP(e)/EMP(t) PS-4/  
 AT/WH/JD/JG  
 S/0020/65/160/005/1133/1135

ACCESSION NR: AP5007572

AUTHOR: Petrov, Yu. I.; Rusin, B. A.

36  
33  
B

TITLE: Disperse condensates of aluminum vapor on glass

SOURCE: AN SSSR. Doklady, v. 160, no. 5, 1965, 1133-1135, and insert facing p. 1134

TOPIC TAGS: aluminum vapor condensation, vacuum evaporation

ABSTRACT: The authors describe the apparatus which they used for vacuum-depositing aluminum on glass plates (see Fig. 1 of the Enclosure) and some interesting phenomena observed during the condensation of the aluminum vapor. The most interesting result was the formation of a deposit in the form of a fine concentric ring around the central specular deposit. Examination of both deposits with an electron microscope showed their structure to be similar and made up of particles at the limit of resolution of the instrument, i.e.,  $\approx 30 \text{ \AA}$ . The results are attributed to the fact that in the vicinity of the evaporator (tungsten filament), the aluminum atoms combine into small aggregates, which, on colliding with molecules of the residual gas, are deflected into the region of the geometrical shade behind the opening of the diaphragm; the escape of groups of atoms from aluminum during vaporization is also

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L 60455-65

ACCESSION NR: AP5007572

possible. The aggregates may be reflected off the plate and diaphragm several times before depositing on the glass, thus giving rise to a bell-shaped density distribution of the deposit. The effect of variations in the relative positions of the openings of the diaphragm on the configuration of the deposits is discussed, as are other geometrical parameters of the system. "The authors thank M. Ya. Gen and Ye. L. Frankevich for a helpful review of the work and a number of valuable suggestions." Orig. art. has: 4 figures. 3

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

SUBMITTED: 05Aug64

ENCL: 01

SUB CODE: MM, MT

NO REF SOV: 006

OTHER: 003

Card 2/3

L. 60455-65

ACCESSION NR: AP5007572

ENCLOSURE: 01

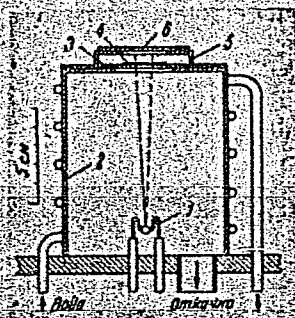


Fig. 1. Diagram of evaporator: 1 - tungsten wire with aluminum charge; 2 - brass screen cooled with circulating water; 3 - diaphragm with various openings; 4 - metal gate; 5 - copper support; 6 - polished glass plate

*lpp*  
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21 (8)

AUTHOR:

Petrov, Yu. I.

NOV/81 14-15/84

TITLE:

The Gamma Radiation From  $U^{235}$  and  $Pu^{239}$  Fission Fragments  
(Gamma-izlucheniye oskolkov  $U^{235}$  i  $Pu^{239}$ )

PERIODICAL:

Atomnaya energiya, 1959, Vol 7, No 2, pp 168-171 (USSR)

ABSTRACT:

The  $\gamma$ -radiation of fission fragments of  $U^{235}$  and  $Pu^{239}$  were examined with an air-equivalent ionization chamber and a Geiger counter. The examinations were carried out in an interval from 0.6 sec to 10 hours after the irradiation of the target. The targets were irradiated with thermal neutrons in the heavy water reactor of the AN SSSR (AS USSR). The short-time (1 sec) irradiation was made with a pneumatic installation. The ionization measurements were conducted with different spacings between the target and the detector and both in water and in open air. A hermetically sealed flat, thin-walled chamber of Plexiglass was used as detector. Its electrodes consisted of an aluminum foil ( $17 \mu$ ). The ionization streams were intensified and recorded with a loop oscillograph; use of a feedback (Ref 2 and 3) the "actual" inverting time constant of the amplifier was reduced to 0.01 sec. The number of fissions in the target was measured by the  $\beta$ -activity of a copper indicator.

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The Gamma Radiation From  $U^{235}$  and  $Pu^{239}$  Fission Fragments SOV/83-7-2-15/21

which was simultaneously irradiated. The copper indicator was changed with the use of a fission chamber which contained an accurately known charge of  $U^{235}$  and  $Pu^{239}$  (This method was developed in 1957 by O. I. Leppunskiy, P. A. Yampol'skiy and V. N. Chumachev). The weight of the  $U^{235}$  and the  $Pu^{239}$  in the target was determined by comparing the  $\gamma$  activity of a simultaneously irradiated standard specimen of uranium ( $U^{235}$  -  $Pu^{239}$ ) with the experimental measuring accuracy (3%). It was established that the  $\gamma$ -radiation of the fission products caused by  $U^{235}$  and  $Pu^{239}$  has the same temporal decrease, the same average energy and the same yield in total  $\gamma$ -energy per fission. Therefore the later mentioned results concern mainly  $U^{235}$ . The obtained data concerning the kinetics of the  $\gamma$ -radiation were compared with the work of I. I. Levintov, V. N. Chumachev and O. I. Leppunskiy. It can be established that the data of the fission of  $U^{235}$  with thermal neutrons and the fission of natural uranium with 14 mev

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The Gamma Radiation From  $U^{235}$  and  $Pu^{239}$  Fission  
Fragments

ICW/89-7-2-15/82

neutrons are identical. The in-space distribution of the  $\gamma$ -radiation in water was also measured. Here good accordance was found when compared with former studies. The total yield of the  $\gamma$ -radiation energy in one second per fission was determined in three methods, each independent from the others: 1) the in-space distribution of the  $\gamma$ -dosis in water was integrated, 2) the data of the ionization measurements in open air were evaluated; as mean  $\gamma$ -energy 1.5 mev was assumed, 3) the  $\gamma$ -activities of  $U^{235}$  and  $Pu^{239}$  targets were compared with a  $Na^{23}$  gauge target which was simultaneously irradiated with thermal neutrons. The measuring results from 1) and 2) are identical up to 5%. In the overlapping range (25-60 sec) the results of 1, 2 and 3 meet up to  $\sim 10\%$ . For the values  $E_{\gamma}(t)$  in the different time intervals the measured curves can be approximated in the following expressions:

$$0.05 \text{ to } 1 \text{ sec: } 0.18 \left[ 1.78 \exp(-3.14t) + 1.37 \exp(-0.545 t) + \exp(-0.091 t) \right]$$

$$10 \text{ to } 60 \text{ sec: } 6.26 \cdot 10^{-2} \left[ 2.18 \exp(-0.159 t) + \exp(-0.0239 t) \right]$$

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The Gamma Radiation From  $U^{235}$  and  $Pu^{239}$  Fission  
Fragments

SOV/89-7-2-15/24

60 to 7200 sec:  $1.145 \cdot 10^{-1.05}$

1.5 to 11 h:  $2.97 \cdot 10^{-4} t^{-1.45}$

The theme of this study was proposed and supervised by Professor  
O. I. Leypunskiy. There are 5 figures, 1 table, and  
10 references, 4 of which are Soviet.

SUBMITTED: March 27, 1959

Card 4/4

PETROV, Yu.I.

Melting of small Pb crystals. Fiz. Tver. tela 5 no.12:3533-3545 1963.  
(MIRA 17:2)

1. Institut khimicheskoy fiziki AN SSSR, Moskva.



ZUBAREVA, N.D.; OBEREMOK-YAKUBOVA, A.P.; PETROV, Yu.I.;  
KLABUNOVSKIY, Ye.I.; BALANDIN, A.A.

Determination of the heats of combustion of DL- and L-mandelic  
acids. Izv. AN SSSR. Ser. khim. no.12:2207 D '63.

(MIRA 17:1)

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

PEIKOV, fu.I.

Anomalies of the thermal expansion and fusion of small aluminum  
crystals. Fiz. tver tela 5 no.9:2461-2476 S '63. (MIRA 12:1)

1. Institut khimicheskoy fiziki AN SSSR.

PETROV, Yu.I.

High-temperature X-ray camera for analyzing powders. Prib. i  
tekh. eksp. 8 no.4:162-164 J1-Ag '63. (MIRA 16:12

1. Institut khimicheskoy fiziki AN SSSR.

REZANOV, I.A.; NGO TKHYONG SHAN; SHEYNMANN, Yu.M.; RATS, M.V.; KRUG, O.Yu.;  
ZYRYANOV, V.N.; RAKCHEYEV, A.D.; YAKOVLFVA, Ye.B.; PETKOVA, M.A.;  
PETROV, Yu.I.; KUZNETSOV, Ye.A.; YUDINA, V.Y.; BARDINA, N.Yu.;  
SIMANOVICH, I.M.; ATANSYAN, S.V.; SERGEYEVA, A.M.; PARFENOV, S.I.;  
RUTKOVSKI, Yatssek [Rutkowski, Jacek]; MAKHLINA, M.Kh.; ZVEREV, V.P.;  
TERNOVSKAYA, V.T.; SAMOYLOVA, R.B.; YEFMAKOVA, K.A.; BYKOVA, N.K.;  
MEYYEN, S.V.; BARSKOV, I.S.; IL'INA, L.B.; BABANOVA, L.I.;  
DOLITSKAYA, I.V.; GORBACH, L.P.; BUTS'KO, S.S.; TRESKINSKIY, S.A.;  
SVOZDETSKIY, N.A.; PRYALVKHINA, A.F.; GROVAL'D, M.G.; MODEL', Yu.M.;  
GORYAINOVA, I.N.; MEDVEDEVA, N.K.; MYALO, Ye.G.; DOBROVOL'SKIY, V.V.;  
KHOROSHILOV, P.I.; CHIKISHEV, A.G.

Brief news. Biul. MOIP. Otd. geol. 40 no.3:122-154 My-Je '65.  
(MIRA 18:8)

L 17544-65 EWP(e)/EWT(m)/EWA(d)/EPR/EWP(k)/EWP(b)/EWP(t) Pf-4/Ps-4 IJP(c)/  
ASD(m)-3/BSO/AS(mp)-2 JD/WB

ACCESSION NR: AP4049604

S/0076/64/038/011/2614/2625

AUTHOR: Petrov, Yu. I. (Moscow); Bibilashvili, R. Sh. (Moscow)

TITLE: Liberation of gaseous products in the oxidation of aluminum and the structural transformations of its oxide film 18 27 B

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 11, 1964, 2614-2625

TOPIC TAGS: oxidation kinetics, aerosol aluminum powder, Colson Russel effect, x ray analysis, stable aluminum hydroxide, lattice constant, crystalline modification, aluminum oxide, aluminum suboxide

ABSTRACT: The oxidation kinetics of an aerosol aluminum powder in air and in rarefied dry oxygen have been studied at 360-600°C by two independent (gravimetric and chemical analysis) methods. The oxidation reaction has been found to give rise to volatile compounds, presumably of the type of  $Al_2O$  suboxides, which may be responsible for the appearance of the Colson-Russel effect (exposure of a photo-emulsion in oxidation of metals). The large specific area of the powder with mean particle diameter of  $1.6 \cdot 10^{-5}$  cm made it possible to follow by X-ray analysis the structural changes of the oxide film on the aluminum surface under varying condi-

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L 17544-65

ACCESSION NR: AP4049604

tions of treatment and storage of the specimens. It has been shown that the primary film formed at room temperature is amorphous and has the composition  $\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$ . By heating the powder in air and in vacuum to temperatures  $\leq 480^\circ\text{C}$  the oxide is transformed into the hydroxide  $\text{AlOOH}$ , stable up to  $600^\circ\text{C}$ . Subsequent heating in vacuum up to  $800^\circ\text{C}$  is accompanied by complete loss of water with conversion of the  $\text{AlOOH}$  to  $\gamma\text{-Al}_2\text{O}_3$ . The high-temperature modification of the oxide film is decomposed at room temperature under the action of moisture with the reversible formation at  $\text{Al}_2\text{O}_3 \cdot 2\text{H}_2\text{O}$ , which in contrast to the initial amorphous state is definitely crystalline. The nature of the transformations of the oxide has been found to depend on the aluminum content in the particles, and on the other hand the state of the film affects the lattice constants of the metal, stretching it at room temperature with a force of  $\sim 6000$  atm. in the case of the crystalline modification of the oxide. Of the three aluminum atoms entering into the oxidation reaction, one is removed by the volatile substances (yield 0.33). In rarefied dry oxygen ( $10^{-1}$ ,  $2 \cdot 10^{-2}$  mm Hg) the yield is diminished to 0.1. Almost complete cessation of gaseous product evolution (yield 0.01) is observed in a mixture of oxygen ( $10^{-1}$  mm Hg) with argon (20 mm Hg). Orig. art. has: 10 figures and 9 tables.

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L 17544-65

ACCESSION NR: AP4049604

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

SUBMITTED: 26Oct63

ENCL: 00

SUB CODE: IC, MM

NO REF SOV: 012

OTHE: 008

Card 3/3

s/0181/63/005/012/3533/3540

ACCESSION NR: AP4004861

AUTHOR: Petrov, Yu. I.

TITLE: When little Pb crystals melt

SOURCE: Fizika tverdogo tela, v. 5, no. 12, 1963, 3533-3540

TOPIC TAGS: lead crystal, lead crystal melting, thermal expansion, melting point, lead crystallite, aerosol particle, lead, melting

ABSTRACT: X-ray studies were made of the thermal expansion and melting of aerosol particles of lead  $\sim 2 \cdot 10^{-6}$  cm in diameter. The author discovered a small overheating of particles to  $\sim 18^\circ$  above the melting point, which is explained by the difficulties of forming nuclei of liquid within the small volume of the substance. He has shown that the course of thermal expansion and the lattice parameters of the particles agree with data for massive metal. In contrast to similar experiments with aerosol particles of aluminum, no effects of oxide coatings were detected. The author measured the temperature factor of x-ray scattering up to the melting point of the crystallites. Observed deviation from the Debye-Waller theory is

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ACCESSION NR: AP4004861

explained by the development of structural lattice defects. On the basis of studies on the function of radially distributed atoms of liquid lead and by comparison of the intensity of radiation scattered by crystallites and the melt, the author concludes that advantages may be gained by employing a polycrystalline model of a liquid. "The author expresses his thanks to Yu. I. Fedorov for his aid in the work." Orig. art. has: 4 figures.

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

SUBMITTED: 05Jul63

DATE ACQ: 03Jan64

ENCL: 00

SUB CODE: PH

NO REF SOV: 015

OTHER: 010

Card 2/2

DR. V. YAGI,

Amesbury, Massachusetts  
1970-1971

Meeting and reports  
Memorandum on the

... ..

KLARUNOVSKIY, Ye.I.; LEBETMAN, M. I.; OSTROY, Yu.I.

Application of optical activity dispersion in the study of the structure of optically active polymers. *Vysokom.sped. t.n.* 9:1579-1582, 1964. (MIRA 17:100)

1. Institut organicheskoy khimii imeni Zelinskogo.

PETROV, Yu.I.; RUSIN, B.A.

Dispersed condensates of aluminum vapor on glass. Dokl. AN SSSR  
160 no.5:1133-1135 F '65. (MIRA 1967)

1. Institut khimicheskoy fiziki AN SSSR. Submitted August 10,  
1964.

L 56077-65 EWP(e)/EWT(m)/EPE(c)/EPA(w)-2/T/EWP(t)/EWP(k)/EWP(z)/EWP(r)/EWA(c)  
Pr-4/Pab20/PI-4 RWE/JD/WW IJP(c)

ACCESSION NR: AP5013808

UR/0126/65/019/005/0667/0674 57  
539.26 49  
B

AUTHOR: Petrov, Yu. I.

TITLE: Effect of thermal defects in metals at elevated temperatures on the intensity of scattered X-rays

SOURCE: Fizika metallov i metallovedeniye, v. 19, no. 5, 1965, 667-674

TOPIC TAGS: thermal defect, x ray scattering, high vacuum, subcrystallite theory, rotational oscillation, Mossbauer effect, aerosol method, lead powder, tin powder, quasiharmonic theory, Debye Waller theory

ABSTRACT: It has been experimentally established that the intensity of X-radiation scattered at high temperatures by the fine powder of a metal with cubic structure, particularly close to the melting point of the crystal, decreases at a much faster rate than predicted by the Debye-Waller theory. A more reliable means of prediction, therefore, is the so-called quasiharmonic approximation, which takes into account the variation in the frequency spectrum due to the thermal expansion of the lattice. This was investigated

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L 56027-65

ACCESSION NR: AP5013808

by the author on using powders of Pb, Bi, Sb, Sn prepared by the aerosol method through condensation of metal vapor in rarefied argon. A droplet of powder suspension in bakelite varnish was deposited in the center of a platinum filament which was rotated about its axis and heated by electric current in a specially designed high-temperature vacuum X-ray camera (tube voltage 33 kv, current intensity 18-20 ma). The bakelite served to reduce the background on the roentgenograms. The experiments with aerosol particles of Pb, Bi, Sb, Sn (mean diameter  $\sim 2.5 \cdot 10^{-6}$  cm) were performed in a high vacuum ( $\sim 10^{-4}$  mm Hg), at temperatures of up to 1000°C and higher. Measurements of the temperature dependence of the intensity of X-radiation scattered by powders of the individual metals showed that the observed deviations from quasi-harmonic approximation and the sharp attenuation of diffraction lines in the neighborhood of the melting point may be attributed to the development of thermal defects construed as rotational oscillations of tiny crystalline groups of atoms (subcrystallites constituting the "building blocks" of monocrystals).<sup>6</sup> It is assumed that as the temperature of the monocrystal of the aerosol particle of a metal increases, the thickness of its amorphous interstrata also increases owing to the internal "evaporation" of atoms from the surface of subcrystallites, and this is

Card 2/3

L 5677-65

ACCESSION NR: AP5013808

accompanied by an increase in the amplitude of their rotational oscillations. The deviations from the quasiharmonic theory were found to be particularly strong in the case of aerosol particles of tin, which may be attributed to the weak influence of the rotational oscillations of subcrystallites on the Mossbauer effect. The theory of the subcrystallite structure of metals may also account for the thermal defects of an unknown nature discovered by Borelius (Solid State Physics, 1958, 6, 65; Arkiv f. Fys., 1959, 15, 65; 16, 119) and Åstrom (Arkiv f. Fys., 1960, 18, 465) in a number of pure annealed metals. These defects are attributed by Åstrom to thermal disturbances in atom groups or, in the terminology used in this article, subcrystallites.

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

SUBMITTED: 17Feb64

ENCL: 00

SUB CODE: SS, OP

NO REP SOV: 007

OTHER: 022

Card

3/3

ACCESSION NR: AP4041722

S/0181/64/006/007/2155/2159

AUTHOR: Petrov, Yu. I.

TITLE: Anomalies of thermal expansion and scattering of X-rays for small nickel particles near the Curie point

SOURCE: Fizika tverdogo tela, v. 6, no. 7, 1964, 2155-2159

TOPIC TAGS: x ray diffraction study, nickel, x ray scattering, nickel, ferromagnet, thermal expansion, magnetic structure

ABSTRACT: To ascertain whether crumbling of nickel leads to effects other than loss of ferromagnetism, and to investigate the physical properties of small ferromagnetic crystals, the author studied by X-ray diffraction the thermal expansion of single-domain nickel particles with average diameter  $\sim 5 \times 10^{-6}$  cm. The nickel powder was prepared by an aerosol method, with metal vapor condensed in a rarefied argon atmosphere. Most particles were oblate spheres and

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ACCESSION NR: AP4041722

had a narrow (2:1) range of particle size. Volume anomalies, exceeding by two orders of magnitude the corresponding effect in bulk metal, were observed near the Curie point. The temperature factor of X-ray scattering obeys in the main the predictions of the Debye-Waller theory, except the temperature region near the Curie point, where the heating of the particles is accompanied by a reduction in intensity and a smearing of the lines. After a repeated heating of the particles, following annealing from temperatures above the Curie point, these anomalies were eliminated. The observed phenomena are explained under the assumption that the particles are made up of a large number of initially oriented magnetic-dipole "subcrystallites," which execute under the influence of the thermal motion small rotational oscillations about the equilibrium position. Orig. art. has: 3 figures.

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

Card 2/5

ACCESSION NR: AP4041723

S/0181/64/006/007/2160/2167

AUTHOR: Petrov, Yu. I.

TITLE: Melting and crystallization of small particles of Bi, Sb, and Pb. Mechanism of phase transformations of metals

SOURCE: Fizika tverdogo tela, v. 6, no. 7, 1964, 2160-2167

TOPIC TAGS: bismuth, antimony, lead, x-ray diffraction study, phase transformation, melting, crystallization

ABSTRACT: Aerosol particles of Bi, Sb, and Pb with diameter  $\sim 2.5 \times 10^{-6}$  cm were investigated by X-ray diffraction. Such a study is of interest because, in view of the absence of complete theory of phase transformations of condensed systems, knowledge of the melting and crystallization of minute metal particles can explain the role of the scale factor and disclose peculiarities not observed in bulk metal. The highly dispersed particles were prepared by drawing

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ACCESSION NR: AP4041723

metal vapor through a rarefied argon atmosphere (0.1 mm Hg) and condensation. Copper X-radiation was used at  $\approx 33$  kV and 20 mA. A lowering of the melting point was observed in the case of Bi and Sb, and superheating in the case of the Pb particles. It is shown that near the melting point the Bi and Sb lattices contract and tend to a closer packing. Freshly prepared Bi powder contained an amorphous fraction which had a long life at room temperature and was stable against heating up to the particle melting point. The results are explained by assuming minute single crystals to consist of many subcrystallites, each with several face-centered cubic unit cells on edge. This holds true even at room temperature. The nature of the subcrystallite boundaries is still unclear. Unlike mosaics, the subcrystallites are not affected by preceding heat treatment or origin. This hypothesis is confirmed by experimental and theoretical results of other authors. "The author is grateful to Yu. I. Fedorov for help with the experiments." Orig. art. has: 6 figures, 2 formulas, and 4 tables.

Card 2/3

ACCESSION NR: AP4041723

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

SUBMITTED: 24Dec63

ENCL: 00

SUB CODE: MM, SS

NR REF SOV: 015

OTHER: 024

ard 3/3

84704

S/020/60/133/006/009,016  
B004/B064

11.2221

AUTHORS: Gen, M. Ya. and Petrov, Yu. I.

TITLE: Emission of Chemically Active Particles in Aluminum<sup>-1</sup>  
Oxidation

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 133, No 6,  
pp. 1361-1363

TEXT: The authors state that aluminum surfaces freshly prepared in vacuum blacken X-ray films in the presence of air. Aluminum was sprayed onto glass plates from glowing tungsten wire at approximately  $5 \cdot 10^{-5}$  torr, or as aerosol in argon at 0.1-1.0 torr. Ordinary photographic films were not sensitive, "X" or "XX" X-ray films were blackened on applying the glass plate. The effect is prevented by luminescent crystals of CsI, NaI, KI, anthracene or naphthalene, by applying an oil film, insertion of black paper, mica, slides or quartz, as well as blowing air between glass plate and film. Fig. 1 shows a diagram of the blackening measured with the ДФ-10 (DFE-10) densitometer as a function of the time elapsed since the production of the aluminum layer. The aluminum particles

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84704

Emission of Chemically Active Particles in  
Aluminum Oxidation

S/020/60/133,001/002/016  
B004/B064

had a diameter of approximately  $10^{-5}$  cm, measured with the EM3 (EMZ) electron microscope. Fresh aluminum layers caused more intensive blackening than older ones at the same time of exposure lasting one hour. Fig. 2 shows the diagram of a glass plate sprayed with aluminum-aerosol on an X-ray film. The more intensive blackening found at the edges is explained by the differences in dispersity and temperature of the particles on the surface and edges of the glass plate. Fig. 3 shows the shadows of slide and quartz, as well as of a two mm high brass ring. The dependence of the blackening on the height of the air layer (up to three cm) in pipes of aluminum, copper, or brass can be seen in Fig. 4. The authors assume that the blackening of the film is caused by an agent formed in aluminum oxidation, presumably ozone. They thank I.V. Yeremina and Yu. I. Fedorov for collaborating. There are 4 figures and 2 Soviet references.

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

PRESENTED: March 31, 1960, by V. N. Kondrat'yev, Academician

Card 2/3

84704

Emission of Chemically Active Particles in  
Aluminum Oxidation

3/320/60, 133/300/300, 133/  
300/300

SUBMITTED: March 26, 1960

A

Card 3/3

L 4953-66 EWT(1)/EWA(j)/EWA(b)-2 JK

ACC NR: AP5025712

SOURCE CODE: UR/0286/65/000/018/0067/0067

AUTHORS: Mitin, N. I.; Petrov, Yu. I.; Syurin, V. N.; Mal'nik, N. N.

24  
B

ORG: none

TITLE: Strain LT of plague of cattle. Class 30, No. 174765

SOURCE: Byulleten' isobreteniy i tovarnykh snakov, no. 18, 1965, 67

TOPIC TAGS: virus LT, cattle, immunity

ABSTRACT: This Author Certificate describes the strain LT of the plague of cattle, 1964. Culture properties: grown on a culture of cattle kidney cells. Causes cytopathogenic action with formation of symplasts, internuclear and cytoplasmatic inclusions on the 4th to 9th day after virus injection. Titer  $10^5$ , TsPD 50/m<sup>2</sup>. Reactogenic properties: causes a light temperature reaction in affected cattle. Antigenic properties: causes the formation of virus-neutralizing and complement-fixing antibodies. Immunogenic properties: causes in animals a sustained immunity to epizootic virus according to the type of interference. Nonreversible; non-contagious.

Card 1/2

UDC: 576.858.7:619:616.998.27

0901524



L 4953-66

ACC NR: AP5025712

SUB CODE: LS/

SUBM DATE: 15Sep64

PC  
Card 2/2

5(4)

SOV/20-127-2-36/70

**AUTHORS:**

Gen, M. Ya., Ziskin, M. S., Petrov, Yu. I.

**TITLE:**

Investigation of the Dispersion Degree of Aluminum Aerosols in Dependence of the Conditions of Their Formation

**PERIODICAL:**

Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 2, pp 366-368 (USSR)

**ABSTRACT:**

Fine-disperse metals stand out because of their high adsorptive and chemical activity. Therefore, the importance was felt of investigating the relationship existing between dispersion degree and activity for particles smaller than  $10^{-5}$  cm. Owing to the difficulty met in preparing particles of sufficiently similar size in the mechanical way, the method by Gen, Zel'manov and Shal'nikov (Ref 1) was applied. Aluminum was evaporated on a tungsten spiral in a glass flask filled with inert gas (Ar, He, H). The loose precipitates forming on the cooled flask wall exhibited a different coloring depending on pressure and kind of gas. The black (finer) precipitates tended to self-ignition in the air. The dispersion of the aerosols was investigated by means of the EMZ electron microscope. The degree of dispersion was determined by counting and measuring the particles on photographs (Fig 1). The differential and

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Investigation of the Dispersion Degree of Aluminum Aerosols in Dependence of the Conditions of Their Formation SOV/20-127-2-36/70

integral distribution curves were in all cases similar to those shown in figure 2 for an argon pressure of 27 mm. The dependence of the weight average of the particle diameters on pressure and kind of gas is illustrated in figure 3. In each gas a maximum diameter characteristic of the respective gas is attained, which does no more change with further pressure increase. In the case of gas pressure below 1 mm the particle diameter was smaller than the resolving power of the electron microscope ( $\sim 10^{-7}$  cm). Table 1 specifies the oxidating properties and the analysis of the aerosols oxidated in the air. Figure 4 shows the dependence of the metal content in the oxidation product on the diameter of the particles. The oxide layer thickness was determined therefrom as amounting to about 10 molecular layers. The spherical form of the particles is a

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Investigation of the Dispersion Degree of Aluminum Aerosols in Dependence of the Conditions of Their Formation SOV/20-127-2-36/70

characteristic feature. Attempts are being made to clarify the structure and the processes in the formation of the solid phase. The authors express their gratitude to A. I. Shal'nikov, Corresponding Member, AS USSR, for valuable advice. There are 4 figures, 1 table, and 1 reference.

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

PRESENTED: March 13, 1959, by V. N. Kondrat'yev, Academician

SUBMITTED: March 3, 1959

Card 3/3

PETROV, Yu.I.; KARAVAYEV, M.M.

Equilibrium in the vapor-phase synthesis of nitric acid. *Izv. vys. ucheb. zav.; khim. i khim. tekhn. no.1:119-122 '58.* (MIRA 11:6)

1. Ivanovskiy khimiko-tekhnologicheskiy institut, Kafedra tekhnologii neorganicheskikh veshchestv.  
(Nitric acid)

ACCESSION NR: AP4011778

S/0181/64/006/001/0315/0316

AUTHOR: Petrov, Yu. I.

TITLE: Temperature factor in the dispersal of x rays during anomalous heat expansion of small aluminum crystals

SOURCE: Fizika tverdogo tela, v. 6, no. 1, 1964, 315-316

TOPIC TAGS: x ray, x ray dispersal, temperature factor, anomalous heat expansion, aluminum, small aluminum crystal, aerosol particle, oxide film, heat treatment

ABSTRACT: The temperature factor related to the dispersal of x-rays in aerosol aluminum dust with a mean particle diameter of  $\sim 3.5 \times 10^{-5}$  cm has been investigated. The powder had been held in dry air for a long time. Apparatus and method used in this work were the same as those previously described by the author (FTT, 5, 2461, 1963; PTE, No. 4, 162, 1963). Experiments were conducted in argon under the pressure of 25 mm Hg. Lines (111), (113), (133), and (115) were measured photometrically on roentgenograms (the intensity of lines at 23C was taken as a unit). Up to the temperature of  $\sim 900$ C theoretical results and those obtained in the present experiments showed good coincidence. At this temperature the anomalous parameter of the metal lattice is approximately the same as that near the melting point (660C) of  
Card 1/2

ACCESSION NR: AP4011778

massive metal and of the same particles covered with amorphous oxide. Thus, at high pressure, the Debye-Waller theory proves correct for  $\theta = \text{const.}$  across the entire temperature range of this investigation. Experiments at atmospheric pressure produce  $\theta$  as a function of the crystal's temperature. Orig. art. has: 1 figure and 2 formulas.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR, Moscow (Institute of Physical Chemistry AN SSSR)

SUBMITTED: 05Jun63

DATE ACQ: 14Feb64

ENCL: 00

SUB CODE: PH

NO REF SOV: 002

OTHER: 002

Card 2/2

S/120/61/000/002/042/042  
E210/E594

AUTHOR: Petrov, Yu. I.

TITLE: A New Method of Evaporation (Vacuum Deposition) of  
Aluminium from a Tungsten Wire

PERIODICAL: Pribory i tekhnika eksperimenta, 1961, No.2, pp.196-197

TEXT: A new method is described of evaporating aluminium, a method of sliding the drop along the vertical. The instrument consists of a 12 cm long evaporator a which is twined from four 0.5 mm dia. W wires and fixed vacuum tight on current supply leads 6 which are cooled by running water and are insulated from the body. A bent nickel-plated copper tube 6 is introduced through the lid, using a rubber seal; this tube can be moved vertically and rotated about its axis by means of the handle 2. With the help of gearing 2 inside the tube, aluminium wire of 1.5 mm diameter is fed through the rubber seal e. The tube is adjusted to the desired height and is turned to the side away from the hot evaporator, which allows the passage of about 50 to 60 A. Then, a second of 2 to 3 cm of aluminium wire is pushed out, which is fed into the evaporator by turning the tube. A bit of aluminium fuses rapidly

Card 1/3



A New Method of Evaporation ...

S/120/61/000/002/042/042  
E210/E594

and contracts into a droplet. It wets the tungsten and slides downwards, evaporating almost instantaneously without reaching the bottom of the evaporator. By displacing the tube along the height of the tungsten rope, the service life can be considerably increased thus reducing the tungsten consumption to about 1 g/l g of evaporated aluminium. If the aluminium wire is well insulated from the current leads, the wire will not scatter during fusion. Otherwise a shunting of the evaporator may occur which leads to throwing off sections of the wire and intensive scattering of fine droplets. The described method has the additional advantage of axial symmetry; no laborious operation is necessary for producing the tungsten spirals. The tungsten wire rope can be easily twined by a hand brace. If necessary, the central tube feeding the aluminium wires can be surrounded by several evaporators which operate alternately. Acknowledgments are expressed to Yu.I. Fedorov for his assistance in the practical work. There are 1 figure and 3 references: 1 Soviet and 2 non-Soviet.

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

Card 2/3

AUTHORS: Petrov, Yu. I., Karavayev, M. M. 153 58-1 18/29

TITLE: The Equilibrium in the Synthesis of Nitric Acid in the Vapor Phase (Ravnovesiye pri parofaznom sinteze azotnoy kisloty)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 1. pp. 119-122 (USSR)

ABSTRACT: The authors introductorily give a survey of publications (references 1 to 5). Since there is always an equilibrated mixture of  $\text{NO}_2$  and  $\text{N}_2\text{O}_4$ , the authors wanted to investigate the equilibrium of the synthesis referred to in the title, if and when 3 reactions take place at the same time:  
 $4\text{NC}_2 + 2\text{H}_2\text{O} + \text{O}_2 \rightleftharpoons 4\text{HNO}_3$  (1),  $2\text{N}_2\text{O}_4 + 2\text{H}_2\text{O} + \text{O}_2 \rightleftharpoons 4\text{HNO}_3$  (2) and  $\text{N}_2\text{O}_4 \rightleftharpoons 2\text{NO}_2$  (3), so more as this problem has never been dealt with in publications. The values of the equilibrium constants of the individual reactions which were calculated by means of the isobar-isothermic potential (references 6 to 9) are given in table 1. The equilibrated gas concentrations for the initial relations can be found by various methods. The authors found it convenient to find these concentrations

Card 1/4

## The Equilibrium in the Synthesis of Nitric Acid in the Vapor Phase

153 58-1-18/29

first by separated  $\text{HNO}_3$ -synthesis by way of  $\text{NO}_2$  and  $\text{N}_2\text{O}_4$ . In this case, multistage equations with one unknown are solved before by the method of selection. After the afore-said concentrations were found with the synthesis according to (1) and (2), the shares of the participation of the partial processes in the total process are found by means of the method of selection (taking account of the equilibrium according to the equation (3)) and the real equilibrated concentrations are consequently found, too. The calculated values of these concentrations of  $\text{HNO}_3$  and of the transformation degrees of the nitrogen oxides in  $\text{HNO}_3$  are given in table 2 for the stoichiometric relation of the components in the temperature series from 325 to 425 °K and with the pressure from 1 atmosphere absolute pressure. According to the increased temperature, the degree of transformation of  $\text{NO}_2$  into  $\text{HNO}_3$  decreases more rapidly than the degree of  $\text{N}_2\text{O}_4$ . According to equation (2), higher degrees of transformation are achieved than according to (1), but in the total process the synthesis by way of  $\text{NO}_2$  prevails. Since the degree of dissociation from  $\text{N}_2\text{O}_4$  to  $\text{NO}_2$ , increases with increasing temperature, the share of the synthesis by way of  $\text{NO}_2$  in the total process increases also. Table 3 shows the

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The Equilibrium in the Synthesis of Nitric Acid in the Vapor Phase

153-58-1-18,29

calculations concerning the influence of the water- and oxygen-concentration on the equilibrated transformation of the nitrogen oxides at 375°K. It hence results that according to the increasing content of steam, the transformation degree of these oxides in  $\text{HNO}_3$  increases continuously. The degree of transformation first increases according to the increasing content of oxygen, with approximately 3 mol it exceeds the culminating point in order to decrease subsequently. A satisfactory conformity of the calculated concentrations with those found by Dzhouns (Jones, ref. 2) indicates that the authors tackled the solutions of the set problems in the right way. There are 4 tables and 9 references, 2 of which are Soviet.

ASSOCIATION: Ivanovskiy khimiko-tekhnologicheskii institut, Kafedra tekhnologii neorganicheskikh veshchestv (Ivanovo Chemical Technological Institute, Chair for the Technology of Inorganic Substances)

SUBMITTED: September 7, 1957  
Card 3/4

PETROV, Yu.I., kand.fiz.-matem.nauk; PETROV, Ye.I., starshiy nauchnyy  
sotrudnik

Stress waves in rod-type machine parts caused by a longi-  
tudinal impact. Izv.vys.ucheb.zav.; mashinostr. no.5:11-24  
'59. (MIRA 13:4)

1. Institut khimicheskoy fiziki AN SSSR (for Petrov).
2. Vsesoyuznyy Nauchno-issledovatel'skiy institut legkogo  
tekstil'nogo mashinostroyeniya.  
(Strains and stresses)

PETROV, Yu.I.

Subthreshold ionization losses in fast-neutron ionization-pulse  
dosimeters. Atom.energ. 3 no.10:326-327 0 '57. (MIRA 10:10)  
(Nuclear counters) (Ionization) (Radiation--Dosage)

PETROV YU I

AUTHOR: Petrov, Yu.I. 89-10-11/36  
TITLE: Subthreshold Ionization Losses in Fast-Neutron Ionization-Pulse  
Dosimeters (Podporogovye poter' ionizatsii : ionizatsionno -  
impul'snom dozimetre bystrykh neytronov)  
PERIODICAL: Atomnaya Energiya, 1957, Vol 3, Nr 10, pp 326-327 (USSR)  
ABSTRACT: By means of a proportional counting tube it is possible, when  
measuring neutron doses, to eliminate the  $\delta$ -sub-ground  
(according to Hurst). The most essential disadvantage of this  
method is caused by the uncontrollable ionization losses (below  
the threshold value). These are measured accurately for the case  
that the recoil protons penetrate from a thick radiator into a  
small gaseous slit which always takes place on the occasion of  
the impinging of neutrons onto the surface of the radiator. It is  
shown that, if the threshold value is 0,1 MeV, the thickness of  
the gaseous slit is 1 cm and the energy of the neutrons to be re-  
corded amounts to 3 MeV, the ionization losses amount to 31%,  
whilst Hurst estimates them only at  $\sim$  0,1. There are 3 tables.  
SUBMITTED: May 24, 1957  
AVAILABLE: Library of Congress

Card 1/1

TOLSTOPYATOVA, A.A.; BALANDIN, A.A.; MATYUSHENKO, V.Kh.; PETROV, Yu.I.

Kinetics of the dehydrogenation and dehydration of alcohols, and of  
the dehydrogenation of hydrocarbons over  $WS_2$  and  $MoS_2$  catalysts. Izv.  
AN SSSR Otd.khim.nauk no.4:583-590 Ap '61. (MIRA 14:4)

1. Institut organicheskoy khimii im. N.D.Zelinskogo AN SSSR.  
(Dehydrogenation) (Dehydration (Chemistry))  
(Molybdenum sulfide) (Tungsten sulfide)



PETROV, Yu.I.

Using tungsten wire in evaporating aluminum. Prib. i tekh. eksp.  
6 no.2:196-197 Mr-Ap '61. (MIRA 14:9)

1. Institut khimicheskoy fiziki AN SSSR.  
(Aluminum) (Metal foils)

ИИХ В, 19.1.; БИИИ. В. 11, 1. 19.

... of products in the ...  
the structural transformations of ...  
38 no. 11: 12-15 N. 10.

... институт химической физики АН СССР

1 20785-65 EWT(m)/EPP(c)/EPR/EWP(j)/T Po-l/Pr-l/Ps-l RPL/ASD(a)-5/SSD/  
SSD(c)/ASD(m)-3/AFETR/ESD(t) RM/WW

ACCESSION NR: AF5003799

8/0190/64/006/008/1487/1492

AUTHOR: Klabunovskiy, Ye. I.; Petrov, Yu. I.; Shvartsman, M. I.

TITLE: Optically active polymers based on esters of methacrylic and itaconic acids

SOURCE: Vysokomolekulyarnyye soyedineniya, v. 6, no. 8, 1964, 1487-1492

TOPIC TAGS: ester, macromolecular chemistry, polymerization, optic property, optic method

ABSTRACT: Optically active polymers: (+)-poly-2-methylbutylmethacrylate, (-)-polymethylmethacrylate, and (+)-poly-di-(2-methylbutyl) itaconate were synthesized by the polymerization of the corresponding optically active esters of methacrylic and itaconic acids. The optically active polymers were synthesized by free-radical polymerization (catalyzed by benzoyl peroxide), anionic polymerization (catalyzed by phenylmagnesium bromide), and thermal polymerization (by heating to 200°). Their properties (softening point, specific rotation, and intrinsic viscosity) were investigated. The polarometric method was shown to be suitable for the study of

B 7

Card 1/2

L 20785-65

ACCESSION NR: AP5003799

polymerization kinetics, using the polymerization of (+)-2-methylbutyl methacrylate as an example. Relationships were found between the specific rotation and the time, degree of polymerization, and molecular weight. Orig. art. has: 1 formula, 4 graphs, 1 table.

ASSOCIATION: Institut organicheskoy khimii im. N. D. Zelinskogo AN SSSR  
(Institute of Organic Chemistry, AN SSSR)

SUBMITTED: 03Oct63

ENCL: 00

SUB CODE: OC, OP

NO REF SOV: 003

OTHER: 018

JPRS

Card 2/2

YEPOMESHNIKOV, V.N.; KIRILLOV, V.P.; KUZ'MIN, V.B.; PETROV, Yu.K.

Dynamics of the effective angle of the sector in accelerators with rectangular sections. Izv. vys. ucheb. zav.; fiz. no. 1:139-144 '60. (MIRA 13:12)

1. Nauchno-issledovatel'skiy institut pri Tomskom politekhnicheskom institute imeni S.M. Kirova.  
(Particle accelerators)

S/052/63/...  
A062/A101

AUTHOR: Petrov, Yu. K.

TITLE: Effect of the sector angle dynamics on the operation of a weak focusing accelerator having 4 rectilinear sections

PERIODICAL: Referativnyy zhurnal, Fizika, no. 1, 1963, 43, abstract 1A.1  
(In collection: "Elektron. uskoriteli". Tomsk, Tomskiy un-t, 1961, 149 - 151)

TEXT: In a weak focusing accelerator, having 4 rectilinear gaps, the equilibrium orbit distortion, due to the decrease of the effective angles of the magnetic sectors (quadrants) during the acceleration process, was studied. The said decrease is caused by eddy currents and remnant induction (for weak fields) as well as by magnet saturation.

A. Fateyev

[Abstracter's note: Complete translation]

Card 1/1

PETROV, Yu.K.; PESHKOV, A.V.; KUZ'MIN, V.N.

Adjusting the radial topography of the magnetic field in  
cyclotrons. Izv.vys.uch.zav.; fiz. no.4:21-27 '62. (MIRA 15:9)

1. Nauchno-issledovatel'skiy institut pri Tomskom politekhnicheskom  
institute imeni S.M. Kirova.  
(Cyclotron)

21.2100

69451

S/139/60/000/01/025/041  
E032/E414

AUTHORS: Yeponeshnikov, V.N., Kirillov V.P., Kuz'min, V.N.  
and Petrov, Yu.K.

TITLE: The Dynamics of the Effective Angle of a Sector in  
Accelerators with Straight Line Sections

PERIODICAL: <sup>19</sup> Izvestiya vysshikh uchebnykh zavedeniy. Fizika.  
1960, Nr 1, pp 139-144 (USSR)

ABSTRACT: The design orbit in accelerators with straight line sections is usually in the form of a closed curve consisting of four straight line sections connected by four circular arcs of radius  $r_0$  and subtending an angle of  $90^\circ$  at the centre. One of the necessary conditions for the actual orbit to coincide with the design orbit is that the magnetic field should be zero over the straight line sections and uniform over the other sections. However, owing to leakage, the true magnetic field always differs from the design field so that it is always necessary to introduce the concept of the effective angle of a sector and this is defined by

Card 1/3

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69451

S/139/60/000/01/025/041  
E032/E414

The Dynamics of the Effective Angle of a Sector in Accelerators  
with Straight Line Sections

Eq (1). The actual distribution of the field is normally of the form indicated by Fig 1. The effective angles of sectors will decrease at low fields owing to eddy currents and residual induction. They will also decrease at high fields owing to saturation effects. This will lead to the appearance of a well-defined fourth harmonic of the distortion of the design orbit, and to a reduction in the maximum energy of the accelerated particles. In the case of inductive acceleration, the betatron ratio is also affected. All these effects have been investigated by the present authors using a plane model. The effects have been found to be small towards the end of the acceleration cycle. They have the biggest effect at the beginning of the cycle. In the latter case the amplitude of the fourth harmonic of the design orbit becomes comparable with the radial dimension of the working region and the change in the betatron ratio may be of the order of a few

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69451

S/139/60/000/01/025/041  
EO32/E414

The Dynamics of the Effective Angle of a Sector in Accelerators  
with Straight Line Sections

tenths of a percent. The reduction in the sector angle  
may be compensated at the beginning of the acceleration  
cycle by increasing the injection energy. The field at  
sector edges may be corrected by d.c. current methods.  
There are 5 figures and 2 references, 1 of which is  
Soviet and 1 English.

ASSOCIATION: NII pri Tomskom politekhnicheskom institute  
imeni S.M. Kirova (Scientific Research Institute of the  
Tomsk Polytechnical Institute imeni S.M. Kirov)

SUBMITTED: April 3, 1959

Card 3/3

S/120/62/000/001/044/001  
E192/E382

24.6.1.9  
AUTHORS: Kuz'min, V.N. and Petrov, Yu.K.

TITLE: Equipment for measuring the meridian plane of the magnetic field in an accelerator

PERIODICAL: Pribory i tekhnika eksperimenta, no. 1, 1962, 177

TEXT: Measurement of the meridian plane is based on the method of a permalloy probe (Ref. 1 - J.M. Kelly - Rev. Scient. Instrum., 1951, 22, 256; Ref. 2 - G. Diambrini-Palazzi - Nuovo cimento, 1956, 3, 336), where the signal due to the transition of the probe through the zero value of the magnetic field is detected by an electronic circuit (Ref. 3 - A.N. Snorin, Yu.N. Metal'nikov, G.M. Bozin and L.V. Yeremin - ITE, 1958, no. 4, 25). The probe is situated in the aperture of the tube of the equipment in such a way that the axis of the permalloy core coincides with the axis of the tube. The tube can be rotated by  $180^\circ$  around its axis and can be fixed in two opposite positions. The axis of rotation of the tube is made horizontal and the tube can be displaced vertically within the air gap of the electro-magnet. The vertical position of the tube, i.e. the coordinate  
Card 1/5

Equipment for measuring ....

S/126/62/050/001/044/001  
E192/E582

of its meridian plane, is determined by hydrostatic levelling with an accuracy of 0.0% cm. The instrument can be carried from one measuring position to another, together with its tripod. Any measurement carried out by the instrument is a result of averaging the readings taken in two opposite positions of the tube, so that the error due to the presence of the vertical projection of the angle between the axis of the permalloy core and the axis of rotation of the tube is eliminated. The instrument can be used when assembling the electromagnet of an accelerator and in this case it is necessary to produce a constant field in the gap of the electromagnet. The instrument was used to measure the meridian plane in a field having a strength of 200 G and the curvature of the field lines of  $1.2 \times 10^{-5}$ /cm. The measurements were carried out while changing the direction of the measured field and four readings were taken at each point.

Card 2/3

Equipment for measuring ....

S/120/62/000/001/044/061  
E192/E582

The error of the measurements was  $\pm 0.5$  mm.  
There is 1 figure.

ASSOCIATION: Nauchno-issledovatel'skiy institut yadernoy  
fiziki, elektroniki i avtomatiki pri Tomskom  
politeknicheskom institute  
(Scientific Research Institute of Nuclear  
Physics, Electronics and Automatics of Tomsk  
Polytechnical Institute)

SUBMITTED: May 8, 1961

Card 5/3

24 6730,

S/139/62/000/004/002/018  
E032/E514

**AUTHORS:** Petrov, Yu.K., Petkov, A.V. and Kuz'min, V.N.

**TITLE:** Correction of the radial topography of the magnetic field in cyclic accelerators

**PERIODICAL:** Izvestiya vysshikh uchebnykh zavedeniy, Fizika, no. 4, 1962, 21-27

**TEXT:** The aim of this work was to investigate whether it would be possible to correct the radial variation in the magnetic field by placing current-carrying conductors directly on the pole faces. Detailed experimental studies have shown that if the distance between the turns of the pole-face coils is made variable and the current through the coils is made to increase linearly at given radial distances, then it is possible (a) to increase the intensity of the focusing magnetic field by about 20% (typically from 9-10 kOe to 12-13 kOe) and (b) to correct the nonlinear saturation effects. In the particular case investigated it was desired to produce a design field of the form

Card 1/2

$$B(x) = B(0) \left[ \frac{r_0}{r_0 + x} \right]^n \quad (1)$$

Correction of the radial ...

S/139/62/000/004/002/018  
E032/E514

with  $0.57 < n < 0.59$  over a radial distance comparable with the pole gap. The experimental data were obtained at the Nauchno-issledovatel'skiy institut yadernoy fiziki, elektroniki i avtomatiki pri Tomskiy politekhnicheskoy institut (Scientific Research Institute for Nuclear Physics, Electronics and Automation of the Tomsk Polytechnic Institute). The experimental data now given may be used as a basis for computing the correction fields for cyclic accelerators. Since the effective magnetic field is increased, there is an associated increase in the limiting energy of the accelerated particles and hence there is an appreciable economic advantage in using this method. There are 10 figures.

ASSOCIATION: NII pri Tomskom politekhnicheskom institute imeni S. M. Kirova (Scientific Research Institute of the Tomsk Polytechnic Institute imeni S. M. Kirov)

SUBMITTED: January 11, 1961

Card 2/2

KUZ'MIN, V.N.; PETROV, Yu.K.

Device for measuring the mediane surface of a magnetic field in  
an accelerator. Prib. i tekhn. eksp. 7 no. 1:177 Ja-F '62. (MIRA 15:3)

1. Nauchno-issledovatel'skiy institut yadernoy fiziki, elektroniki  
i avtomatiki pri Tomskom politekhnicheskoye institute.  
(Magnetic fields--Measurements)



DIMOV, G.I.; PETROV, Yu.K.

Calculation of permissible deviations in the magnetic field  
of a weak focusing accelerator with a split magnet. Izv.  
vys.ucheb.zav.; fiz.; no.5:19-25 '59. (MIRA 13:4)

1. Nauchno-issledovatel'skiy institut Tomskogo politekhnicheskogo instituta.  
(Particle accelerators)

21.2100

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S/139/59/000/05/004/026  
E032/E114

AUTHORS: Dimov, G.I., and Petrov, Yu.K.

TITLE: Calculation of Admissible Magnetic Field Deviation in  
a Weak Focussing Accelerator with a Sectional Magnet <sup>2/</sup>

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy,  
Fizika, 1959, Nr 5, pp 19-25 (USSR)

ABSTRACT: Deviations from the ideal (calculated) magnetic field lead to the distortion of the orbit. The present work is concerned with the relation between the deviation from the ideal field and the orbit distortion. The case considered is that of an accelerator having four sectors and four "straight" regions. An approximate method is given which is based on the use of the fundamental harmonic of the unperturbed free oscillations described by Hill's equation. Using this method the orbit distortion is determined as a function of: 1) radial displacement of the sectors, 2) azimuthal displacement of the sectors, 3) rotation of the sectors in the horizontal plane, 4) vertical displacement of the sectors, 5) rotation of the sectors out of the horizontal plane, 6) rotation of the sectors in the mean meridional plane, ✓

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Calculation of Admissible Magnetic Field Deviation in a Weak  
Focussing Accelerator with a Sectional Magnet

7) differences in the azimuthal dimensions of the  
sectors, and 8) deviation of the azimuthal dimensions  
of all the sectors from the nominal dimensions.

Expressions are derived which can be used to estimate  
these effects.

There are 2 figures, 1 table and 3 references, of  
which 2 are Soviet and 1 is English.

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ASSOCIATION: NII Tomskogo politekhnicheskogo instituta  
(Scientific Research Institute of the Tomsk  
Polytechnical Institute) ✓

SUBMITTED: October 6, 1958

SECRET

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SECRET

PETROV, Yu. K.

"Data on the Mechanism of Natural Antivirus Immunity (on the Model of Bacterial Viruses)".

Novosti Meditsiny. No. 38, pp 82-89, 1953.

White mice were subcutaneously and internally inoculated with the bacteriophages effective against *Bacterium coli*, *Bacillus mycoides*, *Bact. proteus*, *Staphylococcus*. The phages which were inoculated subcutaneously were retained at the site of the inoculation for the longest time and in greatest amounts. The maximum concentration of phages inoculated intravenously was noted in the blood and in the internal organs just after inoculation. The main quantity of phage inoculated into the organism was destroyed or inactivated in it, but was not excreted with urine. The amount of phage excreted with urine was insignificant, averaging .0001%. The destruction of phage in the organism apparently occurred as a result of heat denaturation, or as a result of the inactivating action of the normal blood and serum. Thermoresistant phages are retained in the organism to a greater extent than are thermolabile. In anesthetized animals, phages are retained for a longer time than in normal animals, because the body temperature is lower in the former. (RZhBiol, No. 10, 1955)

SO: Sum No. 884, 9 Apr 1956

Country : USSR  
Category: Virology. Bacterial Viruses (Phages)

Abs Jour: Ref Zhur-Biol., No 23, 1958, 103475

Author : Smorodintsev, A. A.; Petrov Yu. K.

Inst : ..

Title : Bacteriophage as a Model for the Study of Anti-Virus Immunity on Laboratory Animals.

Orig Pub: Sb. Bakteriofagiya. Tbilisi, Gruzmedgiz, 1957, 71-79.

Abstract: An experimentally obtained thermostable phage to the *Bacillus mycoides* was found in a subcutaneous focus for 10 days after subcutaneous injection into white mice, while the original heat-sensitive phage was found for only three to four days. After intravenous injection the former was preserved in the organism for

Card : 1/3

ments the author believes 9

Card : 2/3

Country : USSR  
Category: Virology. Bacterial Viruses (Phages)

.bs Jour: Ref Zhur-Biol., No 23, 1958, 193475

excretory processes of viruses play a protective part  
in natural anti-virus immunity is not well founded. --  
Ya. I. Zhutenshteyn.

Card : 3/3

PETROV, Yu.K.

Effect of nonspecific virus-neutralizing substances from animal sera  
on influenza viruses. Vop. virus. 5 no. 2:167-172 My-S '60.

(MIRA 14:4)

1. Leningradskiy institut vaktsin i syvorotok i otdel virusologii  
Instituta eksperimental'noy meditsiny AMN SSSR, Leningrad.  
(INFLUEUZA) (SERUM)



PETROV, Yu.K.

Allergens of the allantoic fluid in chick embryos infected with influenza virus. Vop. virus. 10 no.1:91-96 Ja-F '65.

(MIRA 18:5)

1. Klinicheskiy meditsinskiy institut, laboratoriya Leningradskoy dezinfektsionnoy stantsii.

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KUZMIN, V.N.; PETROV, Yu.K.

Device for measuring the median surface of a magnetic field  
in an accelerator. (zv. TPI 122:89-9) '62. (MIRA 17 9)

PETROV, Yu.K.; VIZIR', V.A.; PESHKOV, A.V.

Use of a ballistic galvanometer in measuring the absolute  
value of the amplitude of a pulsed magnetic field. Izv.  
TPI 122:94-95 '62. (MIRA 17:9)

PFYROV, Yu.K.

Liquid level indicator. Izv. TPI 122:96-98 '62.

(MIRA 17:9)

L 8552-65 EWE(d)/EEC(k)-2/EEC-4 Po-4/Pq-4/Pg-4/Pk-4/P1-4 ASD(a)-5/  
AFWL/AEDC(b)/SSD/RAEM(c)/ESD(t)/RAEM(t)  
ACCESSION NR: AR4044053

8/0058/63/000/011/E071/E071

SOURCE: Ref. zh. Fizika, Abs. 11E560

AUTHOR: Petrov, Yu. K.; Vizir', V. A.; Pashkov, A. V.

B

TITLE: <sup>G<sup>m</sup></sup> Measurement of the absolute value of the amplitude of a pulsed magnetic field using a ballistic galvanometer

CITED SOURCE: Izv. Tomskogo politekhn. in-ta, v. 122, 1962, 94-95

TOPIC TAGS: pulsed magnetic field, magnetic field, amplitude, ballistic galvanometer, pulse amplitude, polarized relay, thyratron, field transducer

TRANSLATION: To measure the amplitude of the value of a single pulse of a magnetic field with a value of ~12 kilo-oersteds and a duration of ~0,3 sec there is used a search coil connected to a ballistic galvanometer. To obtain a correct value of the pulse amplitude it is necessary to break the circuit of the ballistic galvanometer at the moment the field reaches its maximum. An RP-4 polarized relay is used as the breaker. At the moment the field pulse occurs, the field transducer triggers a driven multivibrator which produces a square pulse; this pulse is

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ACCESSION NR: AR4044053

differentiated by an RC-circuit. The pulse coupled with the trailing edge triggers a thyatron and the relay is opened. The breaking time is established experimentally based on the maximum swing of the galvanometer. Measurement accuracy: ~0.5%.

SUB CODE: EM, EE

ENCL: 00

Card 2/2

ACCESSION NR: AR4022442

S/0058/64/000/001/A038/A039

SOURCE: RZh. Fizika, Abs. 1A351

AUTHORS: Kuz'min, V. N.; Petrov, Yu. K.

TITLE: Instrument for measuring the median magnetic-field surface in an accelerator

CITED SOURCE: Izv. Tomskogo politekhn. in-ta, v. 122, 1962, 89-93

TOPIC TAGS: accelerator, magnetic surface, median magnetic surface, central magnetic surface, permalloy pickup, magnetic probe measurement

TRANSLATION: An instrument developed at the Tomsk Polytechnic Institute for the measurement of the position of the central magnetic plane in an accelerator is described. The measurement accuracy is  $\pm 0.3$  mm. A permalloy pickup and electronic apparatus for the regis-

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ACCESSION NR: AR4022442

tration of the zero of the radial component of the magnetic field by a method described earlier (RZhFiz, 1959, No. 6, 13142) are employed in the instrument. The construction of the mechanism for moving the pickup in the magnet gap and of the liquid-level height indicator used for the measurement of the vertical position of the pickup are described. V. Kanunnikov.

DATE ACQ: 03Mar64

SUB CODE: PH, SD

ENCL: 00

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2/2

PETROV, Yu.K.; MOROZENKO, M.A.; SELIVANOV, A.A.

Producing hyperimmune serums for the prevention and treatment of some influenzalike diseases. Vop. virus. 8 no.1:117 Ja-F'63.

1. Institut eksperimental'noy meditsiny AMN SSSR i Leningradskiy institut vaktsin i syvorotok.  
(INFLUENZA) (SERUM)

VIZIR', V.A.; KUZ'MIN, V.N.; PETROV, Yu.K.

Induction method for measuring the pulse magnetic field in a synchrotron.  
Prib. i tekhn. eksp. 8 no.2:137-139 Mr-Apr '63. (MIRA 16:4)

1. Nauchno-issledovatel'skiy institut yadernoy fiziki, elektroniki i  
avtomatiki pri TPI.

(Synchrotron) (Magnetic measurements)

L 11387-63

EWT(m)/BDS/ES(w)-2 AFFTC/ASD/SSD Pab-4  
S/120/63/000/002/029/041

60

**AUTHOR:** Vizir', V. A., Kus'min, V. N., and Petrov, Yu. K.

**TITLE:** Measurement of the pulsed magnetic field in a synchrotron by the induction method

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**PERIODICAL:** Pribory i tekhnika eksperimenta, March-April 1963, v. 8, no. 2, 137-139

**TEXT:** The article describes an instrument for conducting relative measurements of the instantaneous values of the field strength of the pulsed magnetic field in a synchrotron. Special design features reduce the transients in the measuring circuit from 5 m sec to 50  $\mu$ sec, which makes it possible to measure the dynamic component of the field in the 50-10,000 oersted range with an accuracy of  $\pm$  0.005 percent. This is a considerable improvement over other contemporary instruments. There are three figures.

**ASSOCIATION:** Nauchno-issledovatel'skiy institut yadernoy fiziki, elektroniki i avtomatiki pri TPI (Scientific-Research Institute for Nuclear Physics, Electronics, and Automation at the Tomsk Polytechnic Institute)

**SUBMITTED:** May 8, 1961 (resubmitted April 25, 1962)  
Card 1/1 ja/ll

PETROV, Yu. L.

"The Bone Marrow as a Blood Depot". Cand Med Sci, L'vov State Medical Inst, Chernovitsy, 1954. (RZhBiol, No 2, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)  
SO: Sum. No. 556, 24 Jun 55

PETROV, Yu.L., KOSTOVETSKIY, Ya. I. (Kiyev)

Studying salivation reflexes in making a sanitary rating of water.  
Vrach.delo no.7:723-724 J1'58 (MIRA 11:9)

1. Ukrainskiy institut kommunal'noy gigiyeny.  
(SALIVARY GLANDS)  
(WATER--ANALYSIS)

KALYUZHNYI, D.K., prof., otv.red.; GORODETSKIY, A.S., kand.med.nauk, red.;  
IZDEBSKIY, A.M., kand.med.nauk, red.; KVITNITSKAYA, N.H., kand.  
med.nauk, red.; KRYZHANOVSKAYA, V.V., kand.med.nauk, red.; MARTY-  
NYUK, V.Z., prof., red.; PETROV, Yu.L., kand.med.nauk, red.;  
POZNAANSKIY, S.S., kand.med.nauk, red.; STOVBUN, A.T., kand.med.  
nauk, red.; SHMAL', D.D., kand.med.nauk, red.; POTOTSKAYA, L.A.,  
tekhred.

[Hygienic study and improvement of the environment] Gigeniche-  
skoe izuchenie i ozdorovlenie vneshnei sredy. Kiev, Gos.med.izd-vo  
USSR, 1959. 331 p. (MIRA 13:4)

1. Ukrainskiy nauchno-issledovatel'skiy institut kommunal'noy gi-  
gieny. 2. Predsedatel' Problemnoy komissii Ministerstva zdravo-  
okhraneniya USSR (for Kalyuzhnyy).  
(PUBLIC HEALTH)

PETROV, Yu.L. (Kiyev)

Temperature reactions of human skin under ultraviolet radiation.  
Vrach.delo no.6:623-625 Je '59. (MIRA 12:12)

1. Fiziologicheskaya laboratoriya (zav. - kand.med.nauk Yu.L.  
Petrov) Ukrainskogo instituta kummunal'noy gigiyeny.  
(ULTRAVIOLET RAYS--PHYSIOLOGICAL EFFECT) (SKIN)



NAYSHTEYN, S.Ya., kand.med.nauk; PETROV, Yu.L., kand.med.nauk;  
KOROVITSKIY, A.A., nauchnyy sotrudnik; BOBOK, T.Ye., nauchnyy  
sotrudnik (Elyev)

Sanitary protection of reservoirs from pollution by waste waters  
of tanneries. Vrach.delo no.6:623-627 Je '60. (MIRA 13:7)

1. Ukrainskiy nauchno-issledovatel'skiy institut kommunal'noy  
gigiyeny.

(INDUSTRIAL WASTES) (WATER--POLLUTION)

DAVYDOV, S.A., kand.meditsinskikh nauk; PETROV, Yu.L., kand.med.nauk;  
BOBOK, T.Ye., nauchnyy sotrudnik

Some functional changes in the nasal mucosa under the influence of  
cement dust. Zhur. ush., nos. i gorl. bol. 20 no.4:39-43 J1-Ag  
'60. (MIRA 14:6)

1. Iz Ukrainskogo nauchno-issledovatel'skogo instituta kommunal'noy  
gigiyeny.

(NOSE--DISEASES)

(CEMENT--PHYSIOLOGICAL EFFECT)

PETROV, Yu.L.; KOSTOVETSKIY, Ya.I.

Study of salivary reflexes in man as a method for establishing  
hygienic standards for the taste qualities of water. Gig. i san.  
25 no.1:21-24 Ja '60. (MIRA 13:5)

1. Iz Ukrainskogo nauchno-issledovatel'skogo instituta kommunal'-  
noy gigiyeny.

(SALIVATION physiol.)  
(WATER SUPPLY)

PETROV, Yu.L., kand.med.nauk; NAYSHEYN, S.Ya., kand.med.nauk

Digestive reactions in animals in sanitary and toxicological investigations aimed at establishing norms for substances in the water supply. Gig. i san. 25 no.3:67-70 Mr '60. (MIRA 14:5)

1. Iz Ukrainskogo nauchno-issledovatel'skogo instituta kommunal'noy gigiyeny.

(WATER—POLLUTION)