

L 18852-66

ACC NR: AT6006474

tained at temperatures ranging in 100° intervals from 600 to 1200°C and the relation  $\Delta m^k = s\tau$  (where  $\Delta m$  is the weight gain in g/cm<sup>2</sup>,  $\tau$  is time in min) was obeyed;  $k$  varied as a function of oxidation time and temperature from 0.5 to 2.0. Up to 800°C, a brittle scale formed while at higher temperatures the scale was sintered and became denser and stronger. At constant oxidation times, the sintering caused  $k$  to decrease with increase in temperature. The oxide structures were analyzed by x-ray diffraction. At 500 to 800°C, two layers of  $\alpha$ -Nb<sub>2</sub>O<sub>5</sub> were formed and the lower scale of  $\alpha$ -Nb<sub>2</sub>O<sub>5</sub> had a texture due to contact with the metal. This texture endured oxidation for 3.5 hr at 800°C. Above 800°C,  $\alpha$ -Nb<sub>2</sub>O<sub>5</sub> changed to  $\beta$ -Nb<sub>2</sub>O<sub>5</sub>, especially in the outer layer since  $\alpha$ -Nb<sub>2</sub>O<sub>5</sub> was preserved in the inner scale even after prolonged oxidation. Lattice parameters and intensities were tabulated for oxidation at 1000°C and 4.5 hr for both the external and inner sides of the scale; the oxides  $\beta$ -Nb<sub>2</sub>O<sub>5</sub> and NbO were present, the NbO forming as early as 45 sec at 1000°C. The texture of the scales was further studied by means of electron diffraction and data showed that for oxidation at 1020°C for 20 sec the  $\beta$ -Nb<sub>2</sub>O<sub>5</sub> and NbO had no texture but after 30 sec a texture was observed. For NbO, a (111) texture was determined. The fact that the texture persisted even during the  $\alpha$ -Nb<sub>2</sub>O<sub>5</sub> +  $\beta$ -Nb<sub>2</sub>O<sub>5</sub> transformation confirmed the hypothesis that the oxide formation mechanism was independent of phase composition. Orig. art. has: 5 figures, 3 tables, 1 formula.

SUB CODE: 11, 20, 13/SUBM DATE: 00/      ORIG REF: 003/      OTH REF: 006

Card 2/2 HW

AFANAS'YEV, P.S., dots., kand. tekhn. nauk; SHEVCHENKO, Ye.T.,  
nauchn. red.; KUZNETSOVA, M.I., red.

[Development of the manufacture of Woodworking equipment  
in the U.S.S.R. and in capitalist countries] Razvitie pro-  
izvodstva derevoobrabatyvalushchego obrudovaniia v SSSR i  
v kapitalisticheskikh stranakh. Moskva, 1963. 210 p.

(MIRA 17:8)

1. Moscow. Tsentral'nyy institut nauchno-tekhnicheskoy  
informatsii po avtomatizatsii i mashinostroyeniyu. 2.  
Tsentral'nyy institut nauchno-tekhnicheskoy informatsii  
po avtomatizatsii i mashinostroyeniyu, Moskva (for Afanas'yev).

ZHUKOVSKIY, N.I., inzh.; KUZNETSOVA, M.I., otv. za vypusk; KASHIRIN,  
A.G., tekhn. red.

[Types and basic parameters of instruments and automatic controllers in the state standards of the U.S.S.R.] Tipy osnovnye parametry priborov i avtomaticheskikh regulatorov v gosudarstvennykh standartakh SSSR. Izd. ofitsial'noe. Moskva, Gos.izd-vo standartov, 1961. 751 p. (MIRA 15:2)  
(Automatic control--Standards) (Instruments--Standards)

PEBALK, V.L. ; GEL'FERIN, N.I.; SHASHKOVA, M.N.; KUZNETSOVA, M.I.

Calculation of the processes of liquid extraction from multicomponent solutions. Khim. prom. 41 no.3:212-217 Mr '65. (MIRA 18:7)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni Lomonosova.

KUZNETSOVA, M. I.

"XXVIII. Relative activities of ammonia and aniline in reactions with furan and tetrahydrofuran." Yu. K. Yur'ev, I. K. Korobitsyna, and M. I. Kuznetsova. (p. 1493)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1950, Vol 20, No 8.

LAYNER, D.I.; SOLOV'YEV, V.Ya.; KUZNETSOVA, M.I.; KRUPNIKOVA-PERLINA,  
Ye.I.; SLESAREVA, Ye.N.

Studying the oxidation of niobium. Trudy Giprotsevetestobrabotka  
no.24:75-85 '65. (MIRA 18:11)

MEDINSKIY, Kh.B., (Tashkent); KUZNETSOVA, M.I., (Tashkent).

Experiments on the theory of electrolytic dissociation. Khim.  
v shkole 11 no.5:43-48 S-0 '56. (MLRA 9:11)  
(Electrolysis)

KUZNETSOVA, M.I., red.; MATVEYEVA, A.Ye., tekhn. red.

[Testing measures and instruments for measuring lengths and angles; instructions] Poverka mer i mekhanicheskikh priborov dlia izmereniia dlin i uglov; sbornik instruktsii. Izd. ofitsial'noe. Moskva, Standartgiz, 1963. 534 p. (MIRA 17:1)

1. Russia (1923- U.S.S.R.) Komitet standartov, mer i izmeritel'nykh priborov.



MOCHUL'SKAYA, Yu.Ch.; SEMENYAK, B.I.; Primali uchastiye: PUGACHEVA, L.V.;  
RANTSEVA, M.I.; KUZNETSOVA, M.I.; TETERINA, H.N.; SABUROVA, I.N.

Dressing of kainite-langebeinite ores of the Stebnik ore  
deposit. Khim.prom. no.6:454-456 Je '62. (MIRA 15:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut galurgii i  
L'vovskiy filial Gosudarstvennogo soyuznogo instituta po proyektiro-  
vaniyu predpriyatiy gornckhimicheskoy promyshlennosti.  
(Ore dressing)

GEL'PERIN, N.I.; FEBALK, V.L.; KUZNETSOVA, M.I.

Rotary extraction column with alternating mixing packing-free separation zones. Zhur.VKHO 7 no.1:114-115 '62. (MIRA 15:3)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni Lomonosova.

(Extraction apparatus)

KONOVALOV, V.S., kand. tekhn.nauk; STEFANENKO, S.A., inzh.;  
KUZNETSOVA, M.I., red.; KOVAL'SKAYA, I.F., tekhn. red.

[Mechanization and automation of intrafactory transportation in machinery plants] Mekhanizatsiia i avtomatizatsiia vnutrizavodskogo transporta mashinostroitel'nykh zavodov. Moskva, TSINTIMASH, 1961. 68 p. (MIRA 16:4)  
(Conveying machinery) (Industrial power trucks)  
(Automation) (Cranes, derricks, etc.)

SOKOLOV, N.L.; KUZNETSOVA, M.I., red.; BONDAREV, M.S., tekhn. red.

[Hot extrusion]Goriachaia shtampovka vydavlivaniem. Mo-  
skva, TSINTIMASH. 50 p. (MIRA 16:4)  
(Extrusion (Metals))

GEL'PERIN, N. I.; PERALK, V. L.; YURCHENKO, L. D.; ASHMUS, M. G.; BARANOVA, Z. P.;  
SHABIKOVA, M. N.; CHICKERIN, Y. G.; ZAMENILYAYEV, V. G.; CHUDONOV, Yu. K.)  
KUZNETSOVA, M. I.

"Investigations in the field of the technique of liquid extraction."  
report submitted for 2nd All-Union Conf on Heat & Mass Transfer, Minsk, 4-12  
May 1964.  
Moscow Inst of Light Chemical Technology.

KIVILIS, S.S.; KUZNETSOVA, M.I., red.

[Regulations 28-64 for measuring the consumption of fluids, gases and steam by standard diaphragms and nozzles] Pravila 28-64 izmerenia raskhoda zhidkostei, gazov i parov standartnymi diafragmami i soplami. Izd. ofitsial'noe. Moskva, Izd-vo standartov, 1964. 146 p.  
(MIRA 18:2)

1. Russia (1923- U.S.S.R.) Komitet standartov, mer i izmeritel'nykh priborov.

18.8100 1454

32651  
S/126/61/012/005/004/028  
E073/E535

AUTHORS: Dunayev, F.N. and Kuznetsova, M.K.

TITLE: On the temperature dependence of the magnetostriction of electrical steels

PERIODICAL: Fizika metallov i metallovedeniye, v.12, no.5, 1961, 652-655

TEXT: The dependence was studied of magnetostriction of polycrystalline specimens of electrical steels containing 1.24% Si,  $\text{E1}$ , 1.93% Si,  $\text{E2}$ , 2.74 and 3.36% Si,  $\text{E3}$  and 4.10% Si,  $\text{E4}$  in the temperature range 20 to 750°C in high vacuum. The equipment used ensured reliable compensation of the thermal deformation of the specimen. The sensitivity of the metering set-up was  $3 \cdot 10^{-7} \text{ mm}^{-1}$ , the error of measuring the saturation magnetostriction  $\lambda_s$  did not exceed 6%; the solenoid enabled obtaining a uniform field of up to 1600 Oe throughout the entire length of the  $150 \times 3 \times 0.5 \text{ mm}^3$  specimens. Prior to the measurements the specimens were annealed in high vacuum at 1000°C for two hours and subsequently cooled at a rate of 150°C/hour. The temperature was measured with a maximum error of  $\pm 5^\circ\text{C}$ . As can be  
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seen from Fig.1 (curves 1,2,3,4, and 5 relate, respectively, to steels containing 1.24, 1.93, 2.74, 3.36 and 4.10% Si). The curves of the temperature dependence of the saturation magnetostriction for alloys containing up to 4.10% Si show a maximum which shifts towards lower temperatures as the silicon content increases. The temperature dependence of the saturation magnetostriction  $\lambda_s$  in the temperature range Curie point to maximum  $\lambda_s$  was non-linear for all the alloys investigated. The following qualitative conclusions are arrived at:

- a) The constants of magnetostriction  $\lambda_{100}$  of all the alloys in the investigated range of composition increase with increasing temperature between 20 and 420°C;
- b) The constants of magnetostriction  $\lambda_{111}$  of all the iron-silicon alloys containing up to 4.10% Si are negative and their magnitude decreases monotonically with increasing temperature.
- c) As can be seen from Fig.4, the constant of magnetostriction of  $\lambda_{111}$  decreases monotonically within the investigated range of compositions, whilst the constant  $\lambda_{100}$  appears to have a maximum for a silicon content of 2.5%. Fig.4 shows the dependence of  $\lambda_{max}$ .

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On the temperature dependence ...

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$\Delta\lambda = \lambda_s - \lambda_{max}$  and the constants  $\lambda_{100}$  and  $\lambda_{111}$  on the silicon content. There are 4 figures and 7 references: 5 Soviet-bloc and 2 non-Soviet-bloc. The English-language references read as follows: Ref.4: Tatsumoto E., Okamoto T. J.Phys.Soc.of Japan, 1959, 14, No.11; Ref.7: Carr W. and Smoluchowski R. Phys.Rev., 1951, 83, 6, 1236.

ASSOCIATION: Ural'skiy gosudarstvennyy universitet im.A.M.Gor'kogo (Ural State University imeni A. M. Gor'kiy)

SUBMITTED: March 22, 1961

X

Card 3/43

SULTANOV, G.I.; ZARABELOV, N.A.; KUZNETSOVA, M.M.; BLAZHEVICH, P.V.,  
otv.red.; PEVZNER, A.S., zav. red.izd-va; OSENKO, L.M., tekhn.red.

[Uniform time and pay standards for construction, assembly, and repair operations in 1960] Edinye normy i rastsenki na stroitel'nye, montashnye i remontno-stroitel'nye raboty, 1960 g. Moskva, Gos.izd-vo lit-ry po stroit., arkhitekt. i stroit.materialam. Sbornik 5. [Making and assembling steel construction elements] Montazh i izgotovlenie stal'nykh konstruktsii. No.4. [Assembling welded cylindrical tanks and gasholders] Montazh tsilindricheskikh svarnykh rezervuarov i gasgol'derov. 1960. 23 p.

(MIRA 13:6)

1. Russia (1923- U.S.S.R.) Gosudarstvennyy komitet po delam stroitel'stva. 2. Tsentral'noye normativno-issledovatel'skoye byuro Ministerstva stroitel'stva RSFSR (for Sultanov, Zarabelov, Kuznetsova).

(Gasholders) (Tanks) (Wages)

KUZNETSOVA, M.M.

Subsurface geology and oil potential of the Dzun-Bain Lowland.  
Geol. nefti i gaza 5 no. 3:60-62 Mr '61. (MIRA 14:4)  
(Mongolia--Petroleum geology)

ROZENFEL'D, I.L.; PERSIANTSEVA, V.P.; KUZNETSOVA, M.M.; POLTEVA, M.N.;  
TERENT'YEV, P.B.

Electrochemical behavior of metals in the atmosphere of volatile  
inhibitors. Zhur.prikl.khim. 34 no.10:2239-2244 0 '61.

(MIRA 14:11)

(Metals) (Electrochemistry) (Inhibition (Chemistry))

ROZENFELD, I. I. [Rozenfel'd, I.L.]; PERSIANTEVA, V.P. [Persiantseva, V.P.];  
TERENTIEV, P.B. [Terent'yev, P.B.]; POLTEVA, M.N.; KUZNETOVA, M.M.  
[Kuznetsova, M.M.]

Studies on the influence of chemical composition, structure and  
certain physicochemical properties of the organic compounds upon  
their capacity of braking the corrosion process. *Analele chimie*  
17 no.3:175-196 J1-S '62.

TITARENKO, O.O. [Tytarenko, O.O.]; KUZNETSOVA, M.M.

Effect of microelements on the growth and development of  
decorative flowering plants. Visnyk Bot.sada AN URSR no.4:  
21-23 '62. (MIRA 16:1)  
(Plants, Effect of trace elements on) (Odessa--Flowers)

DOJABCHYAN, Z.L.; KUZNETSOVA, H.M.; SAFARYAN, A.Kh.; ASATRIAN, S.I.

Types of the electromechanical activity of the heart in mitral stenosis. Izv. AN Arm. SSR. Biol. nauki 17 no. 7:37-43 J1 '64.  
(MIRA 17:10)

1. Institut kardiologii i serdechnoy khirurgii ANI SSSR.

VISHNEVSKIY, A.S.; KHODYKIN, A.V.; CHVAMANIYA, A.Ye.; Prinimali  
uchastiyer: TURANSKAYA, A.G., vrach; BARNOVA, M.M., vrach;  
LEVITSKAYA, L.S., vrach; BUBLIK, V.S., vrach; KUZNETSOVA,  
M.M., vrach

Clinical aspect and treatment of chronic pancreatitis at  
a health resort. Vop. kur., fizioter. i lech. fiz. kul't  
29 no.1:23-27 '64. (MIRA 17:9)

1. Yessentukskaya kurortnaya poliklinika (glavnyy vrach  
F.G. Sendarovich.



KUZNETSOVA, M. N.

KUZNETSOVA, M. N., Cand Med Sci -- (diss) "Histopathology of the placenta in acute radiation sickness." Mos, 1958. 11 pp (1st Mos Order of Lenin Med Inst im I.M. Sechenov). 200 copies (KL, 20-58,101)

KUZNETSOVA, M.N.

Remote results of a Cesarean section. Vop. okh. mat. i det.  
3 no. 5:59-63 8-0 '58 (MIRA 11:11)

1. Iz kafedry akusherstva i ginekologii (nav. - prof. K.N. Zhmakin)  
I Moskovskogo ordena Lenina meditsinskogo instituta imeni  
I.M. Sechenova.  
(CESAREAN SECTION)

KUZNETSOVA, M.N., kand. med. nauk

Some diagnostic, clinical and therapeutic problems of the  
premenstrual syndrome. Sov. med. 27 no.2:67-72 F '64.

(MIRA 17:10)

1. Kafedra akusherstva i ginekologii (zav. - prof. K.N. Zhmakin)  
I Moskovskogo ordena Lenina meditsinskogo instituta imeni Sechenova  
na baze Nauchno-issledovatel'skogo instituta akusherstva i gineko-  
logii (dir. - prof. O.V. Makeyeva) Ministerstva zdravookhraneniya  
SSSR.

KUZNETSOVA, M.N.; MAKAROV, V.N.

Mylonitization of rocks of the Yakovlevo deposit in the Kursk  
Magnetic Anomaly. Sbor. nauch. trud. KGRI no.13:47-52 '62.  
(MIRA 16:8)

(Kursk Magnetic Anomaly--Mylonite)

MIKHAYLOV, V.V., doktor tekhn. nauk, prof., red.; GLEZAROVA, I.L., red.; KUZNETSOVA, M.N., red.; KASIMOV, D.Ya., tekhn. red.

[Manufacturing prestressed reinforced concrete elements]  
Proizvodstvo predvaritel'no napriazhenykh zhelezobetonnykh konstruktsii. Pod red. V.V.Mikhaylova. Moskva, Gosstroizdat, 1963. 214 p. (MIRA 17:3)

1. Moscow. Nauchno-issledovatel'skiy institut betona i zhelezobetona.

MIKHAYLOV, K.V., kand. tekhn. nauk, red.; KUZNETSOVA, M.N., red.

[New kinds of reinforcements] Novye vidy armatury. Moskva, Stroizdat, 1964. 202 p. (MIRA 17:4)

SKRAMTAYEV, Boris Grigor'yevich, doktor tekhn. nauk, prof.;  
LESHCHINSKIY, Marat Yur'yevich, kand. tekhn. nauk;  
KUZNETSOVA, M.N., red.

[Testing the strength of concrete in samples, products,  
and buildings] Ispytanie prochnosti betona v obraztsakh,  
izdeliakh i sooruzheniakh. Moskva, Stroiizdat, 1964.  
175 p. (MIRA 17:12)

10

**KUZNETSOVA, M.N.**  
*ca*

Physicochemical analysis of the reaction between organic amines and acids. I. Reaction of urea with fatty acids. A. G. Bergman and M. N. Kuznetsova. *J. Gen. Chem. (U. S. S. R.)* 9, 631-6 (1939).—The reaction is dependent on the mol. wt. of the acid. Of the fatty acids studied, formic, acetic, propionic, butyric, valeric, pelaronic, lauric, palmitic and stearic, only the first 3 react to form compds. of type  $\text{CO}(\text{NH}_2)_2 \cdot 2\text{RCO}_2\text{H}$ , the stability of which decreases with increase in R. Addn. compds. of type 1:1 are not formed. The acids from  $\text{C}_{11}\text{H}_{21}\text{O}_2$  to  $\text{C}_{18}\text{H}_{35}\text{O}_2$  are miscible with urea in all proportions but do not form addn. compds. Beginning with  $\text{C}_{11}\text{H}_{21}\text{O}_2$  limited soly. in the liquid state is noted, the soly. decreasing with increase in R. Both palmitic and stearic acids are practically im-miscible with urea. II. Thermal analysis of the ternary system urea-acetic acid-water. M. N. Kuznetsova and A. G. Bergman. *Ibid.* 637-41.—The equil. diagram for the system, contg. 4 crystn. fields, is divided by the binary section  $\text{H}_2\text{O}$  (I)- $\text{CO}(\text{NH}_2)_2$  (IV) into two ternary systems: I-AcOH (III)-IV with a eutectic at  $-28.5^\circ$  and the compn. 3.5%  $\text{CO}(\text{NH}_2)_2$ , 34.5% III, 63.0% I, and I-IV-II with a eutectic at  $-22.0^\circ$  and the compn. 16.0% II, 12% III, 72.0% I. IV is stable in the presence of I, from which it may be crystd. Tabulated data. John Livak

ASB-15A METALLURGICAL LITERATURE CLASSIFICATION

FROM SOURCE

CLASSIFY ONE QUV 511

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BUZNETSOVA, M. M.

BUZNETSOVA, M. M. - "Investigation of the Interaction of Urea with Saturated Monobasic Acids, Molten and in Aqueous Solution, Using Methods of Physicochemical Analysis." Min Higher Education USSR. Novocherkassk Polytechnic Inst imeni S. Ordzhonikidze. Novocherkassk, 1955. (Dissertation for the Degree of Candidate of Chemical Sciences)

So; Knizhnaya Letopis', No 3, 1955

Kuznetsova M.N.

B-8

USSR/Thermodynamics - Thermochemistry. Equilibria.  
Physical-Chemical Analysis. Phase Transitions.

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18540

Author : M.N. Kuznetsova, A.G. Bergman.  
Title : Physical-Chemical Analysis of Interaction of Amines and  
Acids. III. Thermal Analysis of Ternary System Urea -  
Formic Acid - Water.

Orig Pub : Zh. obshch. khimii. 1956, 26, No 5, 1326-1335

Abstract : The system  $\text{CO}(\text{NH}_2)_2$  (I) -  $\text{HCOOH}$  (II) -  $\text{H}_2\text{O}$  (III) and  
binary system I - II were studied by the method of thermal  
analysis; the presence of combinations of I with II of  
the composition 1 : 2 (IV), melting point  $-11.5^\circ$ , and  
1 : 1 (V) with a transition point at  $-3^\circ$  and 44.5 mol. %  
was established. The cause which had not allowed the  
authors to detect the compound (V) earlier (report II,  
Zh. obshch. khimii, 1939, 9, 637) was disclosed. An

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USSR/Thermodynamics - Thermochemistry. Equilibria.  
Physical-Chemical Analysis. Phase Transitions.

B-8

Abs Jour : Referat Zhur - Khimiya, No 6, 1957, 18540

An eutectic was found in the system II - III at  $-48.5^\circ$   
and 59 mol. % of III; the data (A.A. Glagoleva, Zh.  
obshch. khimii, 1941, 11, 765) concerning the presence  
of two hydrates of II were not confirmed. The eutectic  
in the system I - III is at 12.7 mol. % of I and  $-11.5^\circ$ .  
The graph phase of the system I - II - III plotted basing  
on the study of 13 sections includes 5 crystallization  
field. Both the discovered compounds are stable in pre-  
sence of water and occupy 15.7 (IV) and 8.4% (V) of the  
graph area. This area is divided into two ternary sys-  
tems by the section with IV - III: into the system III  
- IV - II with an eutectic point at  $-49.8^\circ$  and the sys-  
tem III - IV - I with two non-variant points, eutectic  
at  $-39.2^\circ$  and transition point at  $-32.2^\circ$ .

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KUZNETSOVA, M.N.; BERGMAN, A.G.

Physicochemical analysis of the interaction of amines with acids.  
Part 4. Thermal analysis of the ternary system: urea - water -  
- butyric acid. Zhur.ob.khim. 26 no.5:1335-1340 My '56.

(MIRA 9:9)

1. Moskovskiy tekhnologicheskiy institut myasney i mlechnoy pro-  
myshlennosti.

(Urea) (Butyric acid)

5 (4)

## AUTHORS:

Kuznetsova, M. N., Shul'man, M. M.

SOV/79-29-5-69/75

## TITLE:

Physico-chemical Analysis of the Reactions of Amines and Acids  
(Fiziko-khimicheskiy analiz vzaimodeystviya aminov i kislot).  
5. Thermal Analysis of the Three-component System Urea -  
Trichloroacetic Acid - Water (5. Termicheskiy analiz troynoy  
sistemy mochevina - trikhlorkisloty - voda)

## PERIODICAL:

Zhurnal obshchey khimii, 1959, Vol 29, Nr 5, pp 1737 - 1739  
(USSR)

## ABSTRACT:

Nine sections of the melting diagram  $H_2O - CCl_3COOH - CO(NH_2)_2$  were investigated (Figs 1 and 2). A visual method of thermal analysis was applied. As the diagram shows (Fig 3), the stability range of  $CO(NH_2)_2 \cdot CCl_3COOH$  covers 60.8% of the diagram surface. The section  $H_2O - CO(NH_2)_2 \cdot CCl_3COOH$  divides the diagram into two three-component systems:  
1)  $CCl_3COOH - H_2O - CO(NH_2)_2 \cdot CCl_3COOH$  with the eutectic point at  $-38.3^\circ$  and 2)  $H_2O - CO(NH_2)_2 - CO(NH_2)_2 \cdot CCl_3COOH$  with the eutectic point at  $-12.5^\circ$ .

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Physico-chemical Analysis of the Reactions of  
Amines and Acids. 5. Thermal Analysis of the Three-component System Urea -  
Trichloroacetic Acid - Water

SOV/79-29-5-69/75

There are 3 figures and 7 references, 4 of which are Soviet.

ASSOCIATION: Moskovskiy tekhnologicheskij institut myasnoy i molochnoy  
promyshlennosti (Moscow Technological Institute for the  
Meat Packing and Dairy Industry)

SUBMITTED: October 8, 1958

Card 2/2

KUZNETSOVA, M.N.; POTAPOVA, M.A.; SALDADZE, K.M.; OL'SHANOV, K.M.

Description of ions from ion exchangers studied by electro dialysis.  
Izv.vys.ucheb.zav.;khim.i khim.tekh. 5 no.3:418-422 '62.

(MIRA 15:7)

1. Moskovskiy tekhnologicheskii institut myasnoy i molochnoy  
promyshlennosti, kafedra analiticheskoy khimii.

(Description)

(Ion exchange)

(Electrodialysis)

GOLUBEV, V.B.; KUZNETSOVA, M.N.; YEVDOKIMOV, V.B.

Transformations in the quinone-semiquinone-hydroquinone series  
in alkaline medium. Part 1. Zhur. fiz. khim. 37 no.12:2795-  
2796 D '63. (MIRA 17:1)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

GULUBEV, V.B.; KUZNETSOVA, M.N.; YEVDOKIMOV, V.B.

Process of conversions in the quinone - semiquinone - hydroquinone series. Zhur. fiz. khim. 38 no.1:230-231 Ja'64. (MIRA 17:2)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.



BANSHCHIKOV, V.M.; KUZNETSOVA, M.N.; KOVALEVA, Z.Ya.

Some mental changes and treatment in the premenstrual syndrome.  
Trudy 1-go MMI 34:254-264 '64. (MIRA 18:11)

1. Kafedra psikhiiatrii (zav. - zasluzhennyi deyatel' nauki  
prof. V.M. Banshchikov); kafedra akusherstva i ginekologii  
(zav. - prof. K.N. Zhmakin) 1-go Moskovskogo ordena Lenina  
meditsinskogo instituta imeni Sechenova.

MARTYNIENKO, L.I.; ZINTSOVA, Ye.S.; MAKAROV, V.N.; KUZNETSOVA, M.N.;  
KONDRAT'YEVA, D.N.; SOVA, N.G.; TARANETS, V.I.; DOMAREV, D.S.

Stratigraphy of the iron ore complex in the Yakovlevo deposit.  
Sbor.nauch.trud.KGRI no. 21:24-29 '63. (MIRA 17:7)

MARTYNEKO, L.I.; MAKAROV, V.N.; KUZNETSOVA, M.N.; SOVA, N.G.;  
TAFANETS, V.I.; DOMAREV, D.S.; KONDRAT'YEVA, D.N.

Association of minerals in the group of iron oxides in rocks  
and ores of the Yakovlevo deposit in the Kursk Magnetic Anomaly.  
Sbor.nauch.trud. KGRI no. 21:29-36 '63. (MIRA 17:7)

MIRONOV, S.A., doktor tekhn. nauk, prof.; MALININA, L.A., kand.  
tekhn. nauk; KHVOROSTYANSKIY, V.F., inzh.; KOSILOVA, S.Ye.,  
inzh.; KUZNETSOVA, M.N., red.

[Methods for the rapid heat treatment of concrete and  
prospects for using them in the production of precast  
concrete] Metody kratkovremennoi teplovoi obrabotki be-  
tona i perspektivy ikh primeneniia pri proizvodstve sbor-  
nogo zhelezobetona. Moskva, Stroizdat, 1964. 117 p.  
(MIRA 17:8)

GOTSERIDZE, G.G.; VASIL'YEV, A.P.; MIKHAYLOV, V.V.; FEREL'SHTEYN,  
H.L. [deceased]; SHISHKIN, R.G.; YAKUBOVSKIY, B.V.;  
MITNIK, G.S., kand. tekhn. nauk, nauchn. red.; KUZNETSOVA,  
L.N., red.

[Prestressed reinforced concrete; based on materials at the  
Fourth International Congress on Prestressed Reinforced  
Concrete Structures held at Rome and Naples in 1962] Pred-  
varitel'no napriazhenni zhelezobeton; po materialam IV  
Mezhdunarodnogo kongressa po predvaritel'no napriazhennym  
zhelezobetonnyam konstruksiiam (FTP), Rim-Neapol', 1962 g.  
Moskva, Stroizdat, 1964. 281 p. (MIRA 17:10)

KUZNETSOVA, M. N.

USSR/Soil Science - Mineral Fertilizers.

J.

Abs Jour : Ref Zhur - Biol., No 4, 1958, 15334

Author : M.N. Kuznetsova

Inst : -

Title : A Contribution to the Characterization of the Soil Conditions of Plant Feeding at the Kirov Sovkhoz. (K kharakteristike usloviy pochvennogo pitaniya rasteniy v sovkhوزه im. Kirova).

Orig Pub : Pratsi Odes'k. un-tu, Tr. Odessk. Un-ta, 1956, 146, Zb. stud. robit. Sb. stud. robot. No 4, 89-90

Abstract : No abstract.

Card 1/1

[Flora of sporeforming plants of Kazakhstan] Flora sporovykh rastenii Kazakhstana. Alma-Ata, Izd-vo Akad.nauk Kazakhskoi SSR. Vol.3. [Mildew] Muchnisto-rosiarye griby. 1961. 458 p.

(Kazakhstan—Mildew)

(MIRA 15:1)

TITARENKO, Ye.Ye.; KUZNETSOVA, M.N.

Influence of microelements on the productivity of ornamental floral plants. Nauch. dokl. vys. shkoly; biol. nauki no.2:169-173 '61.  
(MIRA 14:5)

1. Rekomendovana Botanicheskim sadom Odesskogo gosudarstvennogo universiteta im. I.I.Mechnikova.

(FLOWERS)

(TRACE ELEMENTS))

SOV/137-58-8-17069

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 124 (USSR)

AUTHOR: Kuznetsova, M.P.

TITLE: Electric Arc Welding of Vibrating Components (Elektrodugovaya svarka detaley v usloviyakh ikh vibratsii)

PERIODICAL: Traktory i sel'khoz mashiny, 1958, Nr 1, pp 32-33

ABSTRACT: The process of arc welding (W) of components which were imparted a vibrating motion of 25 cycles/sec at an amplitude of 2 mm was investigated (the specimens were rigidly mounted on a vibrating table). For comparison purposes, W of plates was also performed by the standard method. Electrodes of the same type and identical welding conditions were employed. Specimens welded under vibration exhibited a greater tensile strength. The microstructure of the weld is uniform and fine-grained; overheating and columnar nature of primary crystallization are not as pronounced as in the case of standard welds.

1. Arc welding
2. Vibration--Metallurgical effects
3. Welds--Properties

Card 1/1



SHAGALOVA, R.Yu.; DAYEV, N.A.; GOL'FERIN, N.I.; KUZNETSOVA, M.P.

Some improvements in the chloral method for the production of  
vanillin and vanillal. Trudy VNIISNDV no.4:34-38 '58.

(Vanillin) (Bourbonal) (Chloral) (MIRA 12:5)

S/276/63/000/004/001/007  
A052/A126

AUTHOR: Kuznetsova, M.P.

TITLE: Cold expansion of metal with vibrating punch

PERIODICAL: Referativnyy zhurnal, Tekhnologiya mashinostroyeniya, no. 4, 1963, 52, abstract 4B246 (In collection "Konstruir. i proiz-vo s.-kh. mashin. Moscow, Mashgiz, 1962, 296 - 298")

TEXT: The possibility is discussed of employing expansion by means of a vibrating punch in agricultural engineering as one of the methods to increase metal strength. The application of this method is illustrated with the expansion of rejected piston pins of automobile and tractor engines to standard demensions. A diagram of an experimental installation is given and a graph showing the dependence of pin expansion on the expanding force (Q) is plotted. The investigations have shown that in the presence of vibration piston pins readily yield to expansion in cold state; the strength of the internal surface increases by 20%, but 70 - 80% of the recovered pins are rejected on account of cracks.

[Abstracter's note: Complete translation.]

T.Kislyakova

Card 1/1

PALISHKIN, D.A.; IVANOV, V.I.; MAKARENKO, L.N.; GMLAOV, K.K.;  
TROSHCHIN, S.I.; KPISYUK, V.I.; STEFANOV, A.D.; SAZONOVA,  
N.I.; KUZNETSOVA, M.P.; PISARENKO, G.N.; LOBKOV, M., red.

[Mechanization in animal husbandry] Mekhanizatsia v zhi-  
votnovodstve. Stavropol', Stavropol'skoe knizhnoe izd-vo,  
1963. 287 p. (MIRA 17:8)

CHAYLAKHYAN, M.Kh., KUZNETSOVA, M.S.

Effect of nicotinic acid and thiourea on the vernalisation of winter wheat. Dokl. AN SSSR 105 no.4:842-845 D '55. (MLRA 9:3)

1. Institut fiziologii rasteniy imeni K.A. Timiryazeva Akademii nauk SSSR.

(Wheat) (Vernalisation)

KUZNETSOVA, H. S.

KUZNETSOVA, H. S. -- "Investigation of the Effect of a Process of  
Calcination of the Mechanical and Dielectric Properties of Steatite."  
Sub 26 May 52, Moscow Order of Lenin Chemicotechnological Inst imeni  
D. I. Mendeleev. (Dissertation for the Degree of Candidate in  
Technical Sciences).

SO: Vechernaya Moskva, January-December 1952

110214100, A, M.S.

The structure and the physiological activity of substituted phenylacetic and naphthylacetic acids. N. N. Melnikov, R. Kh. Iurcinskaya, Yu. A. Baskakov, A. N. Boyarskin, and M. S. Kuznetsova. *Doklady Akad. Nauk S.S.S.R.* 89, 063-6 (1953).—Introduction of halogen into the ring of  $\text{PhCH}_2\text{CO}_2\text{H}$  increases the physiol. activity, which is greatest with Cl; Br is less active; iodine in the  $\beta$ -position does not increase activity. Most active are the 2-halo, least active the 4-halo derivs., while the 3-halo derivs. are intermediate. This is the reverse order of activity in comparison with phenoxyacetic acids. Introduction of a 2nd halogen does not change the physiol. activity, while a 3rd halogen can either reduce or increase activity. A Me group in the  $\beta$ -position reduces the activity, and 2 Me groups reduce it very much. A smaller decrease in activity is caused by a  $\beta$ -MeO group. Halogenation of  $m$ -MeC<sub>6</sub>H<sub>4</sub>OCH<sub>2</sub>CO<sub>2</sub>H causes increased activity, the greatest activity resulting from 4-substitution, and lesser activity from 2-halogenation. With 2,4-D as the standard which gave 100% increase of wheat coleoptile growth at 1 mg./l. concn., and heteroauxin as the standard which gave 100% increase of kidneybean root growth, the following physiol. results were obtained in plant tests: (in above order, with 1, 10, 50 and 100 mg./l. concns. tested for the wheat growth, and 10, 50 and 100 mg./l. concns. for the kidney bean growth). *Substituted phenylacetic acids* (substituents, given): H, m.

70°, -2%, +45%, —, +4%, 0%; *o*-Cl, m. 95°, +70%  
 +84%, —, +5%, +150%, —; *m*-Cl, m. 74°, +95%  
 +81%, —, —, +82%, +280%; *p*-Cl, m. 109°, +135%  
 +71%, —, —, +55%, +91%; *o*-Br, m. 104°, +75%  
 +71%, —, —, +33%, +304%; *p*-Br, m. 114°, +25%  
 +80%, —, —, 0%, +8%; *p*-I, m. 135°, -4%, -6%  
 —, —, 0%, +21%; 2,4-di-Cl, m. 131°, +10%, +80%  
 —, +68%, +162%; 3,5-di-Cl, m. 105°, +13%, +80%  
 —, —, +30%, +120%; 2,3,4-tri-Cl, m. 138°, +40%  
 +71%, —, —, +180%, -60%; 2,4,5-tri-Cl analog, m.  
 126°, 0%, +56%, —, —, +98%, +100%; *p*-MeO, m.  
 83°, —, +20%, +20%, —, 0%, 0%; *p*-Me, m. 93°, —,  
 +5%, +6%, —, 0%, 0%; 4,3-ClMe, m. 83°, +23%  
 +73%, —, —, +7%, +69%; 4,3-BrMe, m. 81°  
 +20%, +71%, —, —, 14%, +90%; 6,3-ClMe, m. 89°  
 -2%, +40%, —, —, 0%, -25%; 6,3-BrMe, m. 83°  
 -8%, +59%, —, —, +66%, +68%; 2,4-ClMe, m. 100°  
 +13%, +44%, —, —, +12%, +33%; 3,4-MeMeO, m.  
 m. 127°, —, +1%, +31%, —, 0%, 0%; 2,4,5-tri-Me, m.  
 117°, —, +3%, -6%, —, -21%, -25%; 2,4-MeMeO, m.  
 m. 107°, —, -12%, +25%, —, 0%, 0%. In substituted  
 naphthylalkylcarboxylic acids it was shown that removal of  
 CO<sub>2</sub>H from the ring by more than 1 C atom reduces the  
 physiol. activity and the compds. with an acid group at the  
 1-position on C<sub>10</sub>H<sub>7</sub> skeleton are the only active ones; sub-  
 stances with 2-substitution are inactive. Substitution of  
 alkyl groups or MeO groups into the C<sub>10</sub>H<sub>7</sub> ring leads to  
 sharp decline in activity. The following results were ob-  
 tained in biol. tests (same standards as above): Substi-  
 tuted 1-naphthaleneacetic acids (substituents given):  
 H, m. 131°, +77%, +169%, —, —, +92%, —; 4-MeO,  
 m. 144°, +2%, -12%, —, +10%, +37%, +9%; 4-Me,  
 m. 148°, +1%, +1%, +4%, +36%, +24%, -10%;  
 4-Et, m. 129°, +9%, —, —, +9%, +6%, +27%; 4-Pr,  
 m. 119°, -5%, -7%, —, +24%, +50%, +33%; 4-Bu,  
 m. 110°, —, -14%, —, +21%, +20%, +33%. 1-  
 C<sub>10</sub>H<sub>7</sub>COCH<sub>2</sub>CH<sub>2</sub>CO<sub>2</sub>H, m. 132°, +9%, +60%, —, —,  
 —, —; 1-C<sub>10</sub>H<sub>7</sub>(CH<sub>3</sub>)CO<sub>2</sub>H, m. 160°, +9%, +46%, —, —,  
 —, —; 2-C<sub>10</sub>H<sub>7</sub>COCH<sub>2</sub>CH<sub>2</sub>CO<sub>2</sub>H, m. 174°, -25%, -0%,  
 —, —; 2-C<sub>10</sub>H<sub>7</sub>(CH<sub>3</sub>)CO<sub>2</sub>H, m. 109°, -3%, -6%,  
 —, —. Most of the above acids were prepd. by the  
 Willgerodt reaction others through the nitriles from the  
 corresponding benzyl halides. G. M. Kosolupoff

GURAVICH, G.P.; KHMILEVA, M.G.; KUZNETSOVA, M.S.

Content of iodine, cobalt and copper in the rations of students  
of a boarding school in Vladivostok. Trudy VladIEMG no.2:  
214-216 '62. (MIRA 18:3)

1. Iz Vladivostokskogo nauchno-issledovatel'skogo instituta  
epidemiologii, mikrobiologii i gigiyeny i Vladivostokskoy  
gorodskoy sanitarno-epidemiologicheskoy stantsii.

KUZNETSOVA, M. S.

112-2-2713

Translation from: Referativnyy Zhurnal, Elektrotehnika, 1957, Nr 2, p. 13 (USSR)

AUTHORS: Fridkin, A. Ye., Kuznetsova, M. S.

TITLE : Thermal Treatment of Porcelain (K voprosu o termicheskoy obrabotke farfora).

PERIODICAL: Tr. Gos. issled. elektrokeram. in-ta, 1956, Nr 1, pp. 25-44

ABSTRACT : Electrical industrial porcelain (  $\phi$  ) is the basic material used in combination with metal parts in a number of very important electrical appliances (air circuit breakers and others). The thermo-elastic properties (the modulus of elasticity, the coefficient of thermal expansion, etc.) of metals and porcelain are different. Ceramic materials obey Hooke's law in a given load interval, but do not have yield properties, and break down when the load is increased within the proportional limit. In addition to this, residual deformation is observed in porcelain after a force applied over a long period of time is removed. Internal stresses are of particularly great importance in porcelain insulators. Research on residual stresses in metals and glass

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112-2-2713

Thermal Treatment of Porcelain. (cont.)

has been going on for quite some time, and on electrical ceramic materials it was initiated in 1952 at Gieki. It is chiefly internal stresses of a primary nature that affect the mechanical strength of porcelain insulators. These stresses balance out within areas with dimensions close to those of the given body. These stresses are usually determined by cutting the sample being investigated into parts and measuring the deformations produced during the process. Residual internal stresses can develop during heating and cooling, for example, those due to the heterogenous plastic deformation of individual parts of the ceramic body, as well as to the irregular development of phase changes throughout the volume of the sample. The modification of quartz into porcelain is an example of this. Still another category is that of temporary thermoelastic stresses. Insulators, especially large ones, often break up during discharge of residual internal stresses. Two methods were used in carrying out research on residual internal stresses: 1) the method of boring layer rings; 2) the bar method. They have found wide application in determining residual stresses in metals. By the first method, the stressed state of hollow porcelain cylinders can be determined by successively removing the outer layers and subsequently measuring the deformations (the change of the inner and outer diameters and of the length of the cylinder).

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112-2-2713

## Thermal Treatment of Porcelain. (cont.)

on the optical indicator. The second method consists of grinding by layers one of the surfaces of the rectangular bar. By measuring the deformations produced in the process, it is possible to determine the value and sign of the residual internal stresses in the axial direction in bars cut from parts of large insulators. The internal stresses were tested under the following thermal treatment conditions (1100° to 800° temperature range): a) annealing - cooling rate, 5 to 15 degrees per hour; b) tempering-cooling rate, 450 degrees per hour; c) cooling rate at 25 degrees per hour (factory practice). The research carried out has established the following: 1. During annealing in the process of cooling, and also during annealing after repeated heating, the deformation of porcelain rings is measurable on the optical indicator. 2. When tempering the fired elements of 400 kv lead in covers, the compression stresses which develop in their surface layers attain 80 kg/cm<sup>2</sup>. In the middle layers the stresses change into tensile stresses with a maximum of 40 kg/cm<sup>2</sup>. 3. Under factory cooling conditions, with a cooling rate of 25 degrees per hour, tensile stresses develop in the rings as well as in the bars (in the surface layers), and, in the inner layers, residual compression stresses develop. 4. Residual internal stresses in porcelain increase with the thickness of the wall and the diameter of the insulator. This is observed during

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112-2-2713

Thermal Treatment of Porcelain. (Cont.)

tempering as well as during cooling. Optimum thermal treatment of products made from electro-technical porcelain (  $\phi$  ) may be ensured by annealing ( removing the permanent stresses ), or by creating reinforcing (compression) stresses on the surface of the product by tempering. Contemporary 110, 220 and 400 - kv insulators have a very complicated form and it is difficult to produce evenly distributed compression stresses on their surface by tempering. Annealing is recommended as the optimum thermal treatment of insulators wherein practically no residual stresses develop. 11 bibliographic entries.

N.V.N.

Card 4/4

*Kuznetsova, M.S.*

110-2-11/22

**AUTHORS:** Fradkin, A.Ye. (Cand.Tech.Sci.), Kuznetsova, M.S. (Cand.Tech.Sci.)  
& Genin, L.G. (Engineer)

**TITLE:** Residual stresses in porcelain insulators. (Ostatochnyye napryazheniya v farforovykh izolyatorakh)

**PERIODICAL:** Vestnik Elektromyashlennosti, 1958, No.2, pp. 37-42. (USSR)

**ABSTRACT:** Internal stresses in materials are classified into three groups, but the article is concerned only with the first of these, namely, temperature stresses during cooling. It is possible to calculate temperature stresses in metallic bodies of simple shape, but little work of this kind has been done on porcelain. The difference between temporary and residual stresses is explained. The method of determining residual stresses is explained. The method of determining residual stresses in porcelain specimens was adapted from metallurgical methods that have been described in the authors' earlier work. One of these methods is the ring method, which is used to determine the stressed condition of hollow cylinders and rings. External (or internal) layers are successively removed and measurements are made of the changes in the internal (or external) diameter. The internal stresses can be calculated from these changes. The rod method was developed by Prof. N.N. Davidenkov. Here one surface of a rectangular cylinder is ground off in layers. The resulting deformation of the opposite side of the block is measured and the stresses are calculated. Stress diagrams for the specimens are then constructed.

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## Residual stresses in porcelain insulators.

110-2-11/22

When the porcelain specimens are cooled in the hardening-temperature range at a speed of the order of  $450^{\circ}\text{C}$  per hour, compressive stresses of some  $80\text{ kg/cm}^2$  are set up near the surface and tensile stresses of the order of  $40\text{ kg/cm}^2$  occur near the centre. With slow cooling, at  $5 - 10^{\circ}\text{C}$  per hour over the same temperature range, there are practically no residual stresses. When cooling at the rate of  $25^{\circ}\text{C}$  per hour, which is common industrial practice, the tensile stress near the surface of the specimens is about  $20\text{ kg/cm}^2$ . Residual stresses of thermal origin are always compressive near the surface, and the stress diagrams obtained indicate the existence of structural stresses. To establish the temperature interval in which stresses are set up, a number of porcelain rings were made and annealed. They were then subjected to various heat-treatments with different rates of cooling. The results of deformation measurements and the corresponding results of stress calculations are given in Figs. 1 & 2. Internal stress can be completely relieved by treatment at  $1100^{\circ}\text{C}$ , and stresses can be set up again by re-heating and relatively rapid cooling. It was then established that changes in the magnitude and sign of the residual stresses depend on the rate of cooling in the temperature range  $800 - 500^{\circ}\text{C}$ . The development of tensile stress in certain cases was attributed to structural changes and in particular to modification of quartz. Insulator porcelain contains up to 17%

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Residual stresses in porcelain insulators.

110-2-11/22

of free quartz, which is converted from the *a* to the *B* form on passing through the temperature of 573°C. Special experiments were undertaken to confirm this hypothesis. The results, given in Fig.3 and Table 2, show that the effect is most marked when the quartz content is high, and is absent when the quartz content is very low. Hence, insulators with no residual stress can be made by appropriate heat-treatment, if the quartz content is kept very low. Another method of reaching low residual stresses is to adapt the heat-treatment to the quartz content. The method by which temperature stresses are set up when porcelain products are cooled, is discussed in some detail. It is considered that residual stresses are unlikely to cause cracks during cooling because they reach their maximum value only when the temperature is uniform throughout the product, i.e. at room temperature. However, they may cause spontaneous cracking during storage, or in service. There are 2 tables, 4 figures, 2 literature references (Russian)

ASSOCIATION: GIEKI.

AVAILABLE: Library of Congress.

Card 3/3

AUTHOR: Kuznetsova, M. S.

SOV/ 72-58-7-8/19

TITLE: ~~The Cooling of Porcelain Products in Periodic Furnaces With Automatic Air Supply~~ (Okhlazhdeniye farforovykh izdeliy v periodicheskikh pechakh s prinuditel'noy podachey vozdukh)

PERIODICAL: Steklo i keramika, 1958, Nr 7, pp. 27 - 29 (USSR)

ABSTRACT: In order to balance the temperature in the furnace, the GIEKI, together with functionaries of the "Izolyator"- and "Proletariy"-Works introduced a cooling method with the suction of cold air below the vault of the furnace. In this way it was possible to reduce the temperature drop in direction of the height of the furnace from 220° to 100 - 120°. GIEKI proposed the method of automatic air supply into the furnace in order to be able to produce articles of larger dimensions. This method was tried with the assistance of the engineers L.G.Genin and G.M. Khlopin in the "Izolyator"-Works. The scheme of the vacuum-and compressed air lines is shown in figure 1. The cooling-process is carried out in 3 temperature intervals: up to 800°, from 800 to 500°, and from 500 to 50°. From 1300 to 800°, the fragment of porcelain is still sufficiently plastic and may therefore be cooled quicker. This may be intensified up to 1000° by opening the furnaces and the

Card 1/2

The Cooling of Porcelain Products in Periodic Furnaces *SV/72-58-7-8/19*  
With Automatic Air Supply

chimney draft. The following cooling regime was by means of tests determined and then introduced during the first 2 to 3 hours - 100 to 150° per hour; up to 850° - 30 to 35° per hour and up to 800° to 20° per hour, in which case the second period (800 to 500°) is considered to be the most dangerous one, since the final solidification of the liquid phase takes place within this temperature interval. It was recommended to fix the cooling velocity for large products in the temperature interval from 500 to 50° with 20 to 25° per hour. The values of the drops in temperature within the period of from 800 to 500°, are given in the table. On the strength of tests, the cooling period was reduced from 77 to 78, to from 60 to 62 hours, and later on to from 52 to 54 hours (Fig 2). There are 2 figures and 1 table.

1. Ceramic materials--Processing
2. Furnaces--Cooling
3. Air--Applications
4. Vacuum systems--Applications

Card 2/2



KOVNATSKIY, M.A.; GORN, L.Y.; GRODZENCHIK, N.A.; YERMAKOVA, P.M.; KONIKOVA, G.S.;  
KORNIGS, A.I.; KUZNETSOVA, M.V.; MEL'NIKOVA, L.M.

Silicosis, etiology, pathogenesis, and clinical aspects. Gig. sanit.,  
Moskva no.8:28-32 Aug 1952. (CML 23:2)

1. Of the Clinical Department of Leningrad Scientific-Research Institute  
of Labor Hygiene and Occupational Diseases.

112-57-7-15920

Translation from: Referativnyy zhurnal, Elektrotehnika, 1957, Nr 7, pp 298-299  
(USSR)

AUTHOR: Bukhman, Ye. N., and Kuznetsova, M. V.

TITLE: Statistical Study of Telephone Traffic Used in Designing Dial Telephone  
Offices (Statisticheskoye izucheniye telefonnoy nagruzki pri proyektirovani  
avtomaticheskikh telefonnykh stantsiy)

PERIODICAL: Uch. zap. po statist., 1956, Nr 2, pp 263-270

ABSTRACT: In constructing new dial-telephone offices, high quality of service and  
minimum construction expenditures can be attained only through correct equip-  
ment design. Telephone traffic fluctuates, depending on the season, time of  
day, and chance factors.

The Erlang tables have been used to determine random fluctuations of traffic  
caused by independent actions of subscribers. In addition to random fluctua-  
tions, it is necessary to allow for irregular fluctuations observed during politi-  
cal campaigns (elections, subscriptions to loans, etc.) and national holidays.

The effect of irregular fluctuations of telephone traffic is particularly pro-  
nounced in the case of large trunk groups connected so that all lines of the

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112-57-7-15920

## Statistical Study of Telephone Traffic Used in Designing Dial Telephone Offices

group are accessible to every party. One of the factors influencing the traffic fluctuations is the concentration of a great number of calls around a certain group of parties (recording board, information, etc.). With all correction factors introduced, the final formula for estimated traffic at a dial telephone office is:

$$Y_{ebh} = Y_{day} \cdot K_{bh} H (1 + \alpha v_{day}) \left(1 + \frac{\alpha v_B}{\sqrt{n}}\right)$$
, where  $Y_{ebh}$  is an estimated value of traffic during the busy hour;  $Y_{day}$  is an average actual traffic over one full day obtained by the random method;  $H$  is a seasonal coefficient of the traffic;  $K_{bh}$  is the coefficient of diurnal concentration of traffic;  $(1 + \alpha v_{day})$  is a coefficient allowing for irregular fluctuations ( $\alpha = 1$  to 3);

$\left(1 + \frac{\alpha v_B}{\sqrt{n}}\right)$  a coefficient allowing for the number of subscribers in a group.

N. V. Z.

Card 2/2

KUZNETSOVA, M. YA.

800-2  
RME-2

4104 AEC-1r-2435 (Pl. 2) (p. 79-84)

RADIOCHEMICAL INVESTIGATION OF THE FISSION OF

TUNGSTEN WITH 280-MEV DEUTERONS. B. V. Kurchatov

Y. N. Mikheday, M. Ya. Kuznetsova, and L. N. Kurchatova.

p. 79-84 of CONFERENCE OF THE ACADEMY OF

SCIENCES OF THE USSR ON THE PEACEFUL USES OF

ATOMIC ENERGY, JULY 4-5, 1955. SESSION OF THE

DIVISION OF CHEMICAL SCIENCE. (Translation). 6p.

This paper was originally abstracted from the Russian  
and appeared in Nuclear Science Abstracts as NSA 9-7937.

4  
EML

**"APPROVED FOR RELEASE: 06/19/2000**

**CIA-RDP86-00513R000928220010-7**

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KUZNETSOVA, M.YA.

48-7-18/21

**AUTHORS:** Kuznetsova, M.Ya. , Mekhedov, V.N.

**TITLE:** A Method for Measuring the Activity of Nuclei Exposed to a K-Capture (Metod izmereniya aktivnosti yader, ispytyvayushchikh K - zakhvat)

**PERIODICAL:** Izvestiya Akad. Nauk SSSR, Ser. Fiz., 1957, Vol. 21, Nr 7, pp. 1020 - 1024 (USSR)

**ABSTRACT:** The isotopes with a deficiency of neutrons are to be considered as the overwhelming portion of the products of the interaction between nuclei and particles with an energy of several hundred MeV. In the case of middle and heavy elements such isotopes in most cases disintegrate by means of the K-capture. The specific peculiarities of the formation of isotopes at high energies as well as of the process of K-capture, make great demands on the method: a) it must guarantee a reliable recording of the weak and weakly-ionizing radiation (10 - 100 keV), b) the efficiency of the radiation recording must be sufficiently high and as far as possible the same for different initial elements, c) beside X-rays or Ogho (Auger?) electrons the apparatus should also record the concurrent radiation of positrons and electrons, as well

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## A Method for Measuring the Activity of Nuclei Exposed to a K-Capture

as the accompanying  $\gamma$ -radiation, d) the possibility should exist to check the connection between the recording radiation and the processes of the K-capture in the case of the respective elements. For their investigations the authors chose X-rays, and the Geiger counters as recorders. Figure 1 shows and explains the scheme of such a magnetic analyzer. The calculated effectiveness curve (I) of the recording of X-rays is given on figure 2, as well as the curve (II) of the variation of the absorption correction for different Z. The process of the identification of X-rays in the case of weak radiation intensities is also explained. Figure 3 records the variation of the mass coefficient of the  $\gamma^{125}$  X-ray absorption in different elements. All resulting values are contained in a table and compared with the calculated ones. This method proved to be suitable for work with a great number of elements up to and including rare earths. It differs advantageously from the other methods by the simplicity of the apparatus and the reliability of the identification of radiation. There are 3 figures, 1 table and 8 references, 5 of which are Slavic.

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2*Lab Nuclear Problems, Joint Inst Nuclear Research*



09-4-5-7/26

AUTHORS: Kuznetsova, M. Ya., Mekhedov, V. N., Khalkin, V. A.

TITLE: Secondary Nuclear Reactions at the Fast Proton Bombardment of Tin ( Vtorichnyye yadernyye reaktsii pri bombardirovke olova byatrymi protonami)

PERIODICAL: Atomnaya Energiya, 1958, Vol. 4, Nr 5, pp. 455 - 460 (USSR)

ABSTRACT: By means of radiochemical methods the yields of the formation of Te-isotopes and of I-isotopes were determined. These nuclei are formed at the vaporization of the tin nucleus at a proton bombardment, by the target nuclei trapping the particles  $He^4$ ,  $Li_3$  and  $Be_4$  which are caused by the vaporization.

Card 1/2 For the different energies of the protons the following cross sections were measured in  $\mu b$ :

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## Secondary Nuclear Reactions at the Fast Proton Bombardment of tin

Formed isotope	$E_p = 170$ MeV	$E_p = 340$ MeV	$E_p = 480$ MeV	$E_p = 660$ MeV
Te <sup>118</sup>	3.6±1.0	16.5±1.5	14.5±7.7	10.0± 1.3
I <sup>120</sup>	0.02±0.01	0.03±0.01	0.10±0.01	0.27±0.20
I <sup>121</sup>	0.020±0.005	0.067±0.003	0.15±0.03	0.240±0.007
I <sup>123</sup>	0.11±0.08	0.30±0.07	0.56±0.16	0.97±0.20
I <sup>124</sup>	~0.01	0.024	0.035	0.060±0.008
I <sup>126</sup>	~0.01	0.02	0.048±0.006	0.06±0.01

The results obtained here agree with the data from reference 6. There are 1 figure, 2 tables and 9 references, 5 of which are Soviet.

SUBMITTED:

June 18, 1957

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1. Tin—Nuclear reactions 2. Proton bombardment 3. Nuclear reactions  
4. Tellurium isotopes (Radioactive)—Determination 5. Iodine isotopes (Radioactive)—Determination

AUTHORS: Kuznetsova, M.Ya., Mekhedov, V.N., SOV/89-4-6-12/30  
 Rybakov, V.N., Khalkin, V.A.

TITLE: Light Tellurium Isotopes (Legkiye isotopy tellura)

PERIODICAL: Atomnaya energiya, 1958, Vol 4, Nr 6, pp 583-583 (USSR)

ABSTRACT: The mass numbers of light tellurium isotopes were experimentally determined ( $A < 118$ ) together with their decay characteristics on the basis of subsidiary substances. An antimony target is bombarded with protons of the synchrocyclotron, and the activities of various chemical fractions are measured (the process of analysis is described). The following determinations were carried out:

Te <sup>121</sup> :	$T_{1/2} \sim 17$ d
Te <sup>118</sup> + Te <sup>119</sup> ;	$T_{1/2} \sim 6$ d
Te <sup>117</sup> ;	$T_{1/2} \sim 1.7$ h; $\beta^+$ : 2.7 MeV; x-rays = 75%
Te <sup>116</sup> ;	$T_{1/2} = 2.5$ h
Sb <sup>116</sup> ;	K-capture 10%.

Card 1/2 There are 7 references, 2 of which are Soviet.

Light Tellurium Isotopes

SOV/ 89-4-6-12/30

SUBMITTED: December 11, 1957

1. Tellurium isotopes (Radioactive)--Decay
2. Tellurium isotopes (Radioactive)--Masses
3. Tellurium isotopes (Radioactive)--Atomic weight
4. Proton bombardment--Applications

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90V/56-34-5-1/61

AUTHORS: Kuznetsova, M. Ya., Mekhedov, V. N., Khalkin, V. A.

TITLE: An Investigation of (p.pxn)-Reactions on Iodine  
(Issledovaniye (p.pxn)-reaktsiy na yode)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,  
Vol. 34, Nr 5, pp. 1096-1100 (USSR)

ABSTRACT: This paper discusses the results of the investigation of  
(p.pxn)-reactions on iodine. The protons used for the bom-  
bardment had energies of from 100 to 660 MeV. For these  
experiments KJ specimens with a weight of 0,1 g were used.  
For the last experiments of this series specimens of elementary  
iodine (0,1-0,3 g) were used. Ag J-targets were used for these  
measurements. The cross-sections of the production of light  
radioactive iodine isotopes by bombarding  $J^{127}$  by protons of  
various energies are given in a table. In the last two columns  
of this table the total cross sections of the production of  
all iodine isotopes and the average numbers of the particles  
emitted during reactions of the type (p.pxn) are given. These  
average numbers are found by averaging over the cross sections.  
From these results one may derive the following results: The

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An investigation of (p.pxn)-reactions on Iodine

energy dependence of the cross section of the productions is the same for nearly any isotope. The cross sections of the reactions vary but little within the energy range of 300-660 MeV and increase at lower energies. The total cross section for 100 MeV protons is three times greater than in the range 300-660 MeV. At any proton energy the isotope  $J^{126}$  has the greatest yield. The yields of the other nuclei decrease gradually with increasing  $x$ . However, the cross section of the production of  $J^{127}$  is greater than the cross sections of the neighboring nuclei and oscillates considerably when the energy of the particles changes. Available experimental results are, however, not sufficient for the interpretation of these oscillations. The yield of the reaction (p.P 7 n) is the smallest and depends only little on proton energy. Besides the ejection of nucleons there is also an "evaporation" (isparenitye) of particles, especially for the light iodine isotopes. The results of this paper agree satisfactorily with those of other papers. The greater the atomic number of the target, the greater the relative cross sections of the production of light isotopes. The observed energy dependence of the reactions (p.pn) and (p.p2n) may be explained by

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the energy dependence of the cross sections of the elementary elastic nucleon-nucleon scatterings. There are 2 figures, 2 tables, and 18 references, 6 of which are Soviet.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy  
(United Institute of Nuclear Research)

SUBMITTED: December 7, 1957

1.Iodine--Bombardment    2.Proton bombardment--Analysis  
3.Proton cross sections    4.Isotopes--Production

Card 5/5

AUTHORS: Kurchatov, B. V., Mekhedov, V. N., SOV/56-35-1-7/59  
Chistyakov, L. V., Kuznetsova, M. Ya., Borisova, N. I.,  
Solov'yev, V. G.

TITLE: Secondary Nuclear Reactions in Bismuth and Lead During  
Bombardment by Protons of High Energy (Vtorichnyye yadernyye  
reaktsii na vismute i svintse pri bombardirovke protonami  
vysokikh energiy)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1958,  
Vol 35, Nr 1, pp 56 - 63 (USSR)

ABSTRACT: In the present paper experiments are described which had  
already been carried out in 1951 - 1952, the results  
and evaluations of which are, however, published only  
now. Bi(Z=83) and Pb(Z=82) was bombarded with protons  
of energies of from 180 to 480 MeV, and astatine isotopes  
(Z=85) were obtained, the production of which was inves-  
tigated by a radiochemical method. With the exception  
of At<sup>211</sup>, which was also obtained from lead, -

Card 1/3 Pb<sup>208</sup>(Li,kn)At<sup>211</sup> -, it was possible to obtain all  
astatine isotopes from bismuth.  $\sigma(A^{211}) = 6.10^{-29} \text{cm}^2$ ,



Secondary Nuclear Reactions in Bismuth and Lead During SOV/56-35-1-7/59  
Bombardment by Protons of High Energy

$\sigma(A^{210}) = 2 \cdot 10^{-29} \text{ cm}^2$ . The At-isotopes found are nearly all  $\alpha$ -active. At<sup>203</sup>( $\alpha, K$ ): T = 7 min, At<sup>204</sup>(K): T = 25 min;  
At<sup>205</sup>( $\alpha, K$ ): T = 25 min; At<sup>206</sup>(K): T = 2,5 h; At<sup>207</sup>( $\alpha, K$  90%):  
: T = 2 h; At<sup>208</sup>(K): T = 6,3 h; At<sup>209</sup>( $\alpha, K$  95%): T = 5,5 h;  
At<sup>210</sup>(K): T = 8,3 h; (For the  $\alpha$ -activity of Po<sup>210</sup> T = 140 d);  
At<sup>211</sup>( $\alpha, K$  60%): T = 7,5 h. The production cross section  
of At<sup>211</sup> in lead was  $\sim 10^{-31} \text{ cm}^2$ . The authors endeavored  
to explain the phenomena observed by assuming them to be  
the result of a secondary reaction of the capture of  
fission products ( $\alpha$ -particles or Li-nuclei). The production  
of light astatine isotopes might be explained by the  
capture of high-energy protons with a following emission  
of  $\pi^-$ -mesons and several neutrons. The cross section  
for the production of  $\alpha$ -particles with  $E > 20 \text{ MeV}$  from  
bismuth irradiated with 480 MeV protons is determined  
from the astatine yield as amounting to (5 to 6)  $\cdot 10^{-25} \text{ cm}^2$   
(Perfilov and Ostroumov (Ref 11) obtained  $(1,5 \div 1,6) \cdot 10^{-25}$   
 $\text{cm}^2$ .) In conclusion Professors B.M. Pontekorvo and I. Ya.

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Secondary Nuclear Reactions in Bismuth and Lead During Bombardment by Protons of High Energy SOV/56-35-1-7/59

Pomeranchuk are thanked for their advice and discussions. There are 2 figures, 4 tables, and 12 references, 2 of which are Soviet.

SUBMITTED: February 20, 1958

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21(7)

SOV/56-37-2-6/56

## AUTHORS:

Borisova, N. I., ~~Kuznetsova, M. Ya.~~, Kurchatova, L. N.,  
Mekhedov, V. N., Chistyakov, L. V.

## TITLE:

Recoil Nuclei in the Disintegration of Silver by Fast Protons

## PERIODICAL:

Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959,  
Vol 37, Nr 2(8), pp 366-373 (USSR)

## ABSTRACT:

In the present paper several experiments carried out in the years 1951/52 were at first discussed, which aimed at the direct determination of the ranges and angular distributions of the recoil nuclei of some disintegration products of silver (cf. Ref 7). Figure 1 shows the special containers used for the investigation of angular and energy distribution. The targets used were silver foils ( $0.5 \text{ mg/cm}^2$ , impurities: Mg, Si, Fe, Al, Pb  $< 10^{-3}\%$ , Au  $< 10^{-3}\%$ ) which were irradiated by protons (particle current  $\sim 0.1 \mu\text{a}$ ). The following was investigated:  
 $\text{Ag}^{103} + \text{Ag}^{104}(\beta^+, \text{K})$ , T = 70 min;  $\text{Ag}^{106}(\text{K})$ , T = 8 d;  $\text{Zr}^{89}(\beta^+, \text{K})$ , T = 80 h;  $\text{Nb}^{90}(\beta^+, \text{K})$ , T = 16 h;  $\text{Rb}^{81} + \text{Rb}^{82}(\beta^+, \text{K})$ , T = 6 h, and

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## Recoil Nuclei in the Disintegration of Silver by Fast Protons

$\text{Se}^{73}(\beta^+, \text{K})$ ,  $T = 6.7 \text{ h}$ . The angular distribution of the products was investigated with the exception of selenium for the three directions: forward, backward, and at  $90^\circ$  to the proton beam (forward:  $5 \leq \theta \leq 58^\circ$ , backward:  $122 \leq \theta \leq 175^\circ$ ); the results obtained are shown in table 1. The result of the investigation of the angular distribution of the observed activities is shown by table 2; figure 2 shows the variation of the ratio of activities, stopped in the first and in the second film with  $\theta$ . (Weak exponential increase with growing  $\theta$ .) In the following, investigations of the energy distribution of the reaction products are described. The same isotopes and also  $\text{Se}^{73}$  for the angle  $90 \pm 40^\circ$  were investigated. The directly measured number of nuclei of each element in % for various ranges is shown by figure 3. The errors in range-values may be explained by the thickness of the polystyrene film. With an increase of the range, the number of recoil nuclei decreases in the case of all elements; with a decreasing  $Z$  the range increases. In figure 4 the range - energy curve is given for polystyrene and silver; the polystyrene curve is considerably higher and has a steeper

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Recoil Nuclei in the Disintegration of Silver by Fast Protons

slope than the silver curve. Figure 5 finally shows the energy distribution of the recoil nuclei at  $90 \pm 40^\circ$ . Finally, there follows a discussion of the results with respect to a qualitative explanation of the distribution laws found. The results seem to confirm the mechanism of the Se, Rb, Zr, and Nb formation by evaporation of  $\alpha$ -particles, protons and neutrons. In this connection table 3 is of great value, which gives the measured and calculated energies and particle numbers ( $\bar{E}(n,p)$ ,  $\bar{E}(n,p,\alpha)$ ;  $\alpha:p:n$ , etc.) for these isotopes. The authors finally thank B. V. Kurchatov and Professor B. T. Geylikman for their help and valuable remarks. There are 5 figures, 3 tables, and 21 references, 8 of which are Soviet.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: March 4, 1959

Card 3/3

ZAYTSEVA, N.G.; KUZNETSOVA, M. Ya.; LEVENBERG, I. Yu.; KHALKIN, V. A.

Light isotopes of iodine. Radiokhimiia 2 no. 4:451-457 '60.

(MIRA 13:9)

(Iodine—Isotopes)

ZAYTSEVA, N.G.; KUZNETSOV, M.Ya.; LEVENBERG, I.Yu.; POKROVSKIY, V.N.;  
KHALKIN, V.A.

Existence of isomers of  $\text{Te}^{119}$ . Izv.AN SSSR.Ser.fiz. 24 no.9:  
1083-1085 S '60. (MIRA 13:9)  
(Tellurium)

83165

S/056/60/039/002/002/044  
B006/B056

24.6600  
AUTHORS:

Van Yun-yuy, Kuznetsov, V. V., Kuznetsova, M. Ya.,  
Khalkin, V. A.

TITLE: Investigation of the Secondary ( $\alpha, xn$ ) Reactions on Bismuth

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,  
Vol. 39, No. 2 (8), pp. 230-234

TEXT: The authors determined the absolute production cross section and the relative yields of  $At^{210}$  and  $At^{211}$  from bismuth irradiated with 120- to 660-Mev protons under rigorous experimental conditions; the experimental data hitherto available in this field (among others those obtained by N. A. Perfilov, V. I. Ostroumov, and B. V. Kurchatov) partly show considerable divergence. High-purity bismuth (impurity concentration  $<10^{-4}\%$ ) was irradiated on the synchrocyclotron of the Laboratoriya yadernykh problem OIYaI (Laboratory of Nuclear Problems of the Joint Institute of Nuclear Research) with 120-660 Mev protons. In order to prevent astatine losses during the irradiation, the bismuth was filled

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( $\alpha, xn$ ) Reactions on Bismuth

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into a quartz ampoule up to half its capacity. Irradiation lasted from five to 15 minutes. The proton beam intensity was determined from the  $\text{Na}^{24}$  production in the aluminum foil surrounding the lower half of the ampoule. The astatine was extracted from the bismuth three hours after the end of irradiation, and was precipitated together with the elementary tellurium. The  $\alpha$ -absorption in the tellurium layer and in the film by which it was covered was experimentally determined, and it was found that 25% of the alpha particles of  $\text{At}^{211}$  ( $E_{\alpha} = 5.86$  Mev) and  $\text{Po}^{211}$  (7.44 Mev) 4

and 30% of those of  $\text{Po}^{210}$  (5.3 Mev) were absorbed in the tellurium layer + film. The alpha activity of the astatine preparations of tellurium was measured by means of a scintillation counter (natural background 10 - 20 pulses/hour). Two half-lives, ( $7.3 \pm 0.2$ ) hours and 140 days, were measured which corresponded to  $\text{At}^{211}$  and  $\text{Po}^{210}$ .  $\text{Po}^{210}$  forms in  $\text{At}^{210}$  decay ( $T_{1/2} = 8.3$  hours; K capture). The production cross sections measured for  $\text{At}^{211}$  and  $\text{At}^{210}$  as well as their ratios are given in a Table. Among other things, the following values were obtained:

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( $\alpha$ ,xn) Reactions on Bismuth

at  $E_p = 130$  Mev -  $0.52$  and  $0.33 \cdot 10^{-29} \text{cm}^2$ ; at  $E_p = 660$  Mev -  $2.60$  and  $2.14 \cdot 10^{-29} \text{cm}^2$  (for  $\text{At}^{211}$  and  $\text{At}^{210}$ , respectively). These values are accurate to within  $\pm 30\%$ . The results obtained indicate that in the range of  $120 \leq E_p \leq 660$  Mev the spectrum of the  $\alpha$ -particles produced in bismuth disintegration hardly changes its shape. The production cross section of  $\alpha$ -particles with  $E > 20$  Mev was calculated and one obtains:

$E_p$ [Mev]	130	170*	300	400	480*	530	580	660
$\sigma(E_\alpha > 20\text{Mev}), [10^{-25}\text{cm}^2]$	0.42	1.03	1.58	1.55	2.03	2.28	1.82	2.1

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The values with asterisks were calculated from a formula by V. V.

Babikov. According to  $P(E) = \frac{E-V}{\tau^2} \exp(-\frac{E-V}{\tau})$  with  $\tau = 6$  Mev,  $V = 12$  Mev, the spectrum of the fast  $\alpha$ -particles was calculated. The result obtained is shown in curve 1 of the Fig.; for comparison, the spectral curves from Refs. 2 and 5 have also been entered. The causes of the quantitative

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( $\alpha, xn$ ) Reactions on Bismuth

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deviations are discussed. The authors finally thank V. N. Makhedov and also B. V. Kurchatov for his interest and advice. There are 1 figure, 1 table, and 19 references: 7 Soviet, 8 US, 2 Dutch, 1 Canadian, and 1 British.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: February 5, 1960

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Bl.960

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B006/B070

24.0600

AUTHORS: Van Yun-yuy, Kuznetsov, V. V., Kuznetsova, M. Ya.,  
Mekhedov, V. N., Khalkin, V. A.

TITLE: Investigation of Secondary Capture Reaction of Lithium  
Nuclei by Lead

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960,  
Vol. 39, No. 3(9), pp. 527 - 535

TEXT: The present paper is a report on the radiochemical investigation  
of the formation of the astatine isotopes <sup>19</sup>At<sup>211,210,207</sup> in the secondary  
reaction  $^{82}\text{Pb}(\text{Li}, \text{xn})^{85}\text{At}$  by bombarding lead with protons (80-660 Mev),  
deuterons (75-370 Mev) and alpha particles (210-810 Mev). The apparatus  
and method of measurement are described in Ref. 15. The lead targets  
(about 1 g) were enclosed in a quartz ampoule, and irradiated for  
0.2-2 hours. For determining the yield, different thicknesses of lead  
foil were irradiated for 2-10 hours. The dependence of the astatine  
yield on the proton energy is given in Table 1: X

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Proton Energy in Mev	At <sup>211</sup>	Yield in $\mu$ b At <sup>210</sup>	At <sup>207</sup> /At <sup>211</sup>	Total Yield in $\mu$ b
660	0.17	0.21	~1.3	~1.3
500	0.06	0.10	-	~0.35
340	0.03	0.08	-	~0.2
120	0.005	0.01	~1.1	~0.03
~80	~0.01	-	-	-

X

For  $E_p = 660$  Mev, a case of At<sup>205</sup> production was also recorded ( $T_{1/2} = 25$  min); At<sup>205</sup>/At<sup>211</sup> ~ 0.1. The yield of At<sup>211</sup> as a function of the energy of the bombarding particles ( $\alpha, p, d$ ) is shown in Fig. 1. The highest yield (~0.3  $\mu$ b) was obtained by bombardment with alpha particles, and this is only slightly dependent on the energy. When the alpha energy is high, At<sup>211</sup> may be formed also by the alpha capture of Pb<sup>208</sup> (and  $\pi^-$  n emission) or Pb<sup>207</sup> (and  $\pi^-$  emission). The fraction of these reactions is, however, unimportant. Fig. 2 shows the At<sup>211</sup> yield

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Investigation of Secondary Capture Reaction of Lithium Nuclei by Lead S/056/60/039/003/046/058/XX  
B006/B070

as a function of the target thickness. The yield increases monotonically from 0.03 to 0.3 mm, and remains constant with a further increase in thickness. In the discussion of the results, the authors compare the  $E_p$  dependence of the total production cross section of astatine isotopes from lead with that of iodine isotopes from tin (Fig. 3). An estimate of the energy spectra of the Li fragments and their production cross section from lead is made by a method suggested by B. V. Kurchatov et al. (Ref. 10). Assuming that  $Li^6$ ,  $Li^7$ , and  $Li^8$  have similar energy spectra, the spectrum may be described by  $P(E)dE = \tau^{-2} (E-V)\exp(-(E-V)/\tau)dE$ . The excitation functions of the most important production reactions of At isotopes by capture of  $Li^6$  and  $Li^7$  were calculated according to Jackson's method, and are represented in Fig. 4 ( $\sigma = f(E_{Li})$ ). The ratio between the Li yields from lead was determined to be  $Li^6:Li^7:Li^8 = 0.55:0.41:0.043$ . The parameters  $V$  and  $\tau$  from the spectrum formula are given in Table 2 for several yield ratios. The best agreement with the experiment is found for  $V = 6 - 10$  Mev and  $\tau = 10.5 - 11.5$  Mev.

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Investigation of Secondary Capture Reaction of Lithium Nuclei by Lead S/056/60/039/003/046/058/XX  
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Fig. 5 shows the Li spectrum for  $E > 30$  Mev ( $V = 6$  Mev,  $-11.5$  Mev). From the astatine production B for a given proton energy and using the for-

mula  $B = N_0 \sigma_{Li}^P \sigma_{At}^{Li} \Delta l$ , the production cross section of Li nuclei  $\sigma_{Li}^P$ , and the production cross section of  $At^{211}$  averaged over the energy is calculated to be  $\sigma_{Li}^P = 3.-4$  mb and  $\sigma_{At}^{Li} = 0.1$  b.  $\Delta l$  denotes the half thickness of the Pb target in which the production of  $At^{211}$  begins to deviate from the constant value. The authors thank Ye. N. Sinotov, A. S. Karaymyan, and A. A. Pleva for help, and B. V. Kurchatov for critical remarks. The spectroscopic determination of the lead impurities was carried out by M. Farafonov of GEOKhI. There are 5 figures, 2 tables, and 29 references: 13 Soviet, 12 US, 1 Dutch, 1 British, 1 Italian, and 1 Canadian.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: March 12, 1960

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33188

S/186/61/003/006/009/010  
E040/E185

24.6600  
AUTHORS:

Kuznetsova, M.Ya., Min Nam Buk, Rybakov, V.N., and  
Khalkin, V.A.

TITLE:

Formation of  $Tel_{27}$  from  $Il_{27}$  under bombardment by  
high-energy protons

PERIODICAL: Radiokhimiya, v.3, no.6, 1961, 755-759

TEXT:  $Ni_{65}$  appears to be formed by the  $Cu_{65}(p, p\pi^+) Ni_{65}$   
reaction when copper is bombarded by high-energy protons. Because  
no success was achieved in the further study of the above reaction  
using  $La_{139}$  and  $Au_{197}$  targets, an investigation was made of  $Tel_{27}$   
formation from  $Il_{27}$  under the action of protons with the energy of  
120-660 meV. The investigation was made in the internal beam of  
the synchrocyclotron at the Ob'yedinennyy institut yadernykh  
issledovaniy (Joint Nuclear Research Institute). Full details  
are given of the test methods employed, as well as the data for  
the dependence of  $Tel_{27}$  formation from  $Il_{27}$  as a function of the  
energy of the bombarding protons (table). In order to obviate the  
difficulties usually associated with the determination of the

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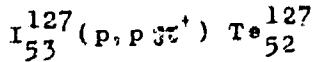


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Formation of Te<sup>127</sup> from I<sup>127</sup> ....

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radioactivity of Te<sup>127</sup>, the electronic component of the target radiation was determined by means of a magnetic analyzer (Ref. 9; M. Ya. Kuznetsova, V.M. Mekhedov, Izv. AN SSSR, seriya fiz., v. 21, 7, 1020, 1957). An analysis is made of the reactions leading to the formation of Te<sup>119</sup> and Te<sup>127</sup> isotopes under the conditions used in the experiments. It is concluded that Te<sup>127</sup> is formed mainly by the reaction  $I_{53}^{127} (n, p) Te_{52}^{127}$  under bombardment with protons in the energy range of 120-660 meV. The experimentally observed elevated yield of Te<sup>127</sup> in the proton energy range of 160-260 meV is interpreted as being due to the reaction



There are 1 table and 20 references; 10 Soviet-bloc, 1 Russian translation from non-Soviet-bloc publication, and 9 non-Soviet-bloc. The four most recent English language references read as follows:

Ref. 13: E.B. Paul, R.L. Clarke,  
Canad. J. Phys., v. 31, 2, 267 (1953).

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Formation of Te<sup>127</sup> from I<sup>127</sup> ...

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Ref.15: N. Metropolis, R. Bivins, M. Storm, A. Turkevich,  
J.M. Miller, G. Friedlander.  
Phys. Rev., v.110, 185 (1958).

Ref.16: N. Metropolis, R. Bivins, M. Storm, J. Miller,  
G. Friedlander, A. Turkevich.  
Phys. Rev., v.110, 204 (1958).

Ref.20: W. Winsberg,  
Phys. Rev., v.95, 198 (1954).

SUBMITTED: October 31, 1960

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KUZNETSOVA, M. YA.

SESSION E-5-7: Bioelectric Effects II.

The Time Factor in the Reaction of the Central Nervous System to Radiation

4

N. N. Lirshits, E. S. Melnik, Z. I. Apawzenko, and M. A. Kuznetsova

The latent period of the flexory defensive reflex in rabbits subjected to 400 r total X-irradiation, given either in a single dose or in doses of 10 r daily, five times weekly, was substantially the same for the two methods of exposure. The electrical conductivity of the encephalic cortex of white rats showed that a 600 r  $\gamma$ -irradiation of the animals at 0.3 r/min affects the dynamics of the electric resistance of the brain considerably more than the same dose given at 600 r/min. The conditioned reflex of white rats given 160 r  $\gamma$ -irradiation chronically at 0.276 r/hr for 22 hours daily was found to be less affected than after acute irradiation at a dose rate of 83 r/min. The leucopenic reaction of peripheral blood of the animals in all three cases was found to be more sudden in the case of acute exposure, i.e. for higher dose rates.

Thus, within the dose range of 160-600 r, we found, in all three tests used, either an equivalent or a higher degree of damage to the central system with the chronic, protracted or fractionated irradiations than with the acute irradiations. In contrast, the injuries in peripheral blood are more substantial in the case of acute irradiations.

Institute of Biophysics, Academy of Sciences, Moscow, USSR

report presented at the 2nd Intl. Congress of Radiation Research, Harrogate/Yorkshire, Gt. Brit. 3-11 Aug 1962

KUZNETSOVA, M. Ya.; POKROVSKIY, V. N.; RYBAKOV, V. N.

[Study of the reaction  $Al^{27}(p, p\pi^+)Mg^{27}$ ] Izluchenie reaktsii  
 $Al^{27}(p, p\pi^+)Mg^{27}$ . Dubna, Ob"edinennyi in-t iadernykh issle-  
dovaniy, 1962. 10 p. (MIRA 15:2)  
(Nuclear reactions)