PAVLOVSKAYA, T.Ye.; PASYNSKIY, A.G.

Effect of ionizing radiations on protein solutions in the presence of air and in vacuum [with summary in English]. Biokhimiia 22 no.1/2:266-273 Ja-F '57. (MIRA 10:7)

1. Institut biokhimii im. A.N.Bakha Akademii nauk SSSR, Moskva.
(ROENTGEN RAYS, effects,
on serum albumin solution in presence of air & in vacuum (Rus))
(SERUM ALBUMIN,
eff. of x-rays on solution in presence of air & in vacuum (Rus))

PASYNSKIY, A.G.; TONGUR, A.M.

Periodic deformation of collagen in solutions of electrolytes and tanning agents [with summary in English]. Koll.zhur. 19 no.4:483-489 Jl-Ag '57. (MIRA 10:10)

1.Institut biokhimii AN SSSR im. A.N. Bakha, Moskva.
(Collagen) (Tanning)

PASYNSKIY, A.G. (Moskva)

The theory of open systems and its importance in biochemistry.
Usp.sovr.biol. 43 no.3:263-279 My-Je '57. (MLRA 10:7)
(PHYSIOLOGICAL CHEMISTRY)

PASYNSKIY, A. G. and PAVLOVSKAYA, [illegible]

"Amino-Acids Formation when Exposing Formaldehyde and Ammonium Salts Solutions to Ultraviolet Irradiation."

paper presented at the 4th Intl. Congress of Biochemistry, Vienna, 1-6 Sep 58.

PASINSKIY A G

UNCLASSIFIED

PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON ENZYME CHEMISTRY, Tokyo & Kyoto, 1957
AUTHOR: Organizing Committee, International Symposium on Enzyme Chemistry, Tokyo,
Maruzen, 1958.

A G Pasynsky

Enzymatic Reactions in Steady Open Systems

A G Pasynsky

PASYNSKIY, A.G.

Relationship between thermal and ultraviolet denaturation of proteins. Biofizika 3 no.6:736-737 '58. (MIRA 12:1)

1. Institut biokhimii im. A.N. Bakha AN SSSR, Moskva.
(PROTEINS,
heat & ultraviolet denaturation (Rus))
(ULTRAVIOLET RAYS, eff.
protein denaturation (Rus))

PASYNSKII, A.G.

Behavior of polymers in the organism [with summary in English]. Izv. AN SSSR. Ser.biol. no.6:641-650 N-D '58 (MIRA 11:11)

1. Institut biokhimii im. A.N. Bakha AN SSSR.
(MACROMOLECULAR COMPOUNDS)
(PHYSIOLOGICAL CHEMISTRY)

PASYNSKIY A. G.

AUTHORS: Kaverzneva, Ye. L., Doctor of Chemical Sciences, Khurgin, Yu. I. SOV/30-58-9-42/51

TITLE: Biologically Active Polymer Compounds (Biologicheski aktivnyye polimery) All-Union Conference on Highly Molecular Compounds (Vsesoyuznaya konferentsiya po vysokomolekulyarnym soyedineniyam).

PERIODICAL: Vestnik Akademii nauk SSSR, 1958, Nr 9. pp. 111 - 113 (USSR)

ABSTRACT: The X All Union Conference took place in Moscow from June 11th to 13th. About 400 representatives of scientific institutions and colleges took part. In his opening-speech V.A.Kargin stressed the fact that, as there are structural analogies between natural and synthetic polymer compounds the task is set to bring about a controlled synthesis of models of biological objects. Further reports were delivered by: B.N.Tarusov, A.G.Pasynskiy on some peculiarities of biological textures.
- G.M.Frank on the submicroscopic structure of some cell textures and muscle fibrils.
- K.G.Ioffe gave particulars on the location of 18 amino-acids

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Biologically Active Polymer Compounds. All Union Conference on Highly Molecular Compounds. SOV/3o-58-9-42 1

in the tyrosine bearing peptide.
- M.I.Plekhan on some peculiarities concerning peptides.
- Ye.D.Kaverzneva, F.V.Shmakova on the extraction of carbohydrate bearing peptide from egg albumin and the determination of its amino-acid content.
- S.Ye.Bresler, S.Ya.Frenkel' consider the configuration of the individual globular protein to be metastable.
V.A.Belitser recommends to distinguish denaturation from some other slight modifications of structure.
V.I.Kasatochkin, R.A.Dulitskaya examined kinetics and thermodynamics of renaturation under pressure.
M.B.Kalmakarova on the modification of structure of complex proteins.
D.N.Shigorin, N.V.Mikhaylov examined the typical bands in infrared adsorption spectra.
N.S.Andreyeva recommended a new classification of the kinds of polypeptide chains according to structure.
M.I.Millionova, N.S.Andreyeva constructed a model of polymer glycyl-L-proline.

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Biologically Active Polymer Compounds. All Union Conference on Highly Molecular Compounds. SOV/30-58-9-42/51

- A.L.Zaydes on characteristics of various collagens.
- Yu.A.Vladimirov, S.V.Konev on the mechanism of energy migration of light quanta in protein.

M.S.Volkova, A.G.Pasynskiy made use of the radiation method for molecular weight determination of protein.
G.V.Samsonov, R.B.Ponomareva, L.V.Dmitrenko gave particulars on the chromatographic purity determination of protein.
A.N.Belozerskiy spoke about the composition of nucleinic acids secreted by micro-organisms and plants.
V.S.Diskina, V.S.Tongur, D.M.Spitkovskiy spoke about the production of desoxy nucleoproteids by means of serum albumin and α-Chymotrypsin.
S.Ye.Bresler, Kh.M.Rubina on the part played by ribonucleic acid in the fermentative biosynthesis of protein.
M.A. Prokof'yev and Z.A. Shabarova mention experimentally obtained data on the synthesis of derivatives of amino acids with nucleotides and nucleosides.

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Biologically Active Polymer Compounds. All Union Conference on Highly Molecular Compounds. SOV/30-58-9-42/51

A.S. Spirin and L.P. Gavrilova reported on the results of investigations of ribonucleic acid of the tobacco mosaic virus. P.S. Vasil'yev spoke about the protein structures which are necessary for blood-transfusion. M.F. Shostakovskiy about how polyvinylpyrrolydone is obtained and how it is used as blood substitute. M.G. Brazhnikova dealt with the investigation of a large group of antibiotics of polypeptide type. The members of the conference stressed the necessity of the establishment of a special institute for protein research. It was recommended to promote the training of teams in the corresponding fields of science.

Card 4/4

BUDNITSKAYA, Ye.V., BORISOVA, I.G., PASYNSKIY, A.G.

Changes in the lipid metabolism of plants caused by ionizing radiations [with summary in English]. Biokhimiia 23 no.6:849-855 N-D '58 (MIRA 11:12)

1. Institut biokhimii imeni A.N. Bakha AN SSSR, Moskva.
(LIPID METABOLISM)
(PLANTS, EFFECT OF X RAYS ON)

SOV/20-120-1-38/63

AUTHORS: Budnitskaya, Ye. V., Borisova, I. G., Pasynskiy, A. G.

TITLE: The Influence of Ionising Radiations on the Activity of Lipoxidase in Seedlings of Various Plant Species (Deystviye ioniziruyushchikh izlucheniy na aktivnost' lipoksidazy v prorostkakh rasteniy razlichnykh vidov)

PERIODICAL: Doklady Akademii Nauk SSSR, 1958. Vol. 120. Nr 1, pp. 140 143 (USSR)

ABSTRACT: In earlier published papers (Refs 1, 7) the authors of this and other papers proved that lipoxidase is resistant against irradiation in vitro. In this paper the effect of x-ray irradiation in vivo on soy beans, peas, beans, (Phaseolus), wheat and maize is examined. The method of irradiation and examination of the mentioned activity is described. By means of the method described the dependence of lipoxidase activity in the leaves of seedlings of various plant species upon the dose of x-ray irradiation was determined. The activity in seedlings not irradiated was found to amount to 100 %. Results are shown in table 1. Herefrom it was possible to con-

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The Influence of Ionising Radiations on the Activity of Lipoxidase in Seedlings of Various Plant Species

clude that the lipoxidase of various plant species does not react in the same way when irradiated. Thus the irradiation of corn seedlings with 1000 to 50 000 r leads already 2 - 4 hours after irradiation to a slight decrease of activity; later (after 24 to 48 hours) there is a sudden drop. On the other hand, the lipoxidase of wheat, beans and soy beans is being "activated" by the same dose within 24 hours after irradiation. Similar results are known in the case of other ferments (Refs 3 - 5, 7 - 12). In order to be able to explain the activation mechanism of the lipoxidase the authors studied the permeability change of the plant tissue in radiation. In this connection the fact was taken into account that the increase of permeability may be coupled with the increase of the effective ferment amount (Refs 3 - 6). The method employed in this case is described (Ref 15). Results are shown in table 2. It follows that the increase of lipoxidase activity in the experiments in vivo takes a course similar to that of the modification of the relative permeability of the tissue. Finally, the chemical changes of the free lipides in the leaves during irradiation were examined. From table 3 it may

The Influence of Ionising Radiations on the Activity of Lipoxidase in Seedlings of Various Plant Species

be seen that in the fraction of free lipides the irradiated bean leaves contain 6 times as many peroxides as the leaves which were not irradiated. Irradiation in vivo requires much smaller doses to show changes in the lipoxidase system than the experiment in vitro. The occurrence of an activation phase of the ferment system in the case of not very high doses and of incubation of short duration is typical of experiments in vivo. The change of the relative permeability of the seedling leaves (Table 2) shows that during the ionizing irradiation a disturbance of the inner cellular structure takes place, which facilitates a washing out of electrolytes into the outer milieu (zones). This probably explains the changes in lipoxidase activity. There are 3 tables and 23 references, 13 of which are Soviet.

ASSOCIATION: Institut biokhimii im. A. N. Bakha Akademii nauk SSSR (Institute of Biochemistry imeni A. N. Bakh, AS USSR)

SOV/20-120-1-38/63

The Influence of Ionising Radiations on the Activity of Lipoxidase in Seedlings of Various Plant Species

PRESENTED: January 3, 1958, by A. I. Oparin, Member, Academy of Sciences, USSR

SUBMITTED: January 2, 1958

1. Phospholipids--Chemical reaction 2. Seeds--Test methods
3. X-rays--Biochemical effects

Card 4/4

PHASE I BOOK EXPLOITATION SOV/3659

Pasynskiy, Anatoliy Germanovich

Kolloidnaya khimiya (Colloidal Chemistry) Moscow, Gos. izd-vo "Vysshaya shkola," 1959. 264 p. 12,000 copies printed.

Ed. (Title page): V.A. Kargin, Academician; Ed. (Inside book): A.B. Luk'yanov; Ed. of Publishing House: T.G. Lipkina; Tech. Ed.: S.S. Gorokhova.

PURPOSE: This is a textbook for biology majors in universities and correspondence schools and may also be useful to scientific workers and engineers.

COVERAGE: The book describes the general characteristics of colloidal systems including the molecular, kinetic, optical, and electrochemical properties of colloids and their stability and coagulation. It also describes the properties of solid polymers and explains the phenomena of surface tension and adsorption as well as the nature of emulsions, aerosols, gels, foams, and solutions of high-molecular substances. The author thanks Academician

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Colloidal Chemistry SOV/3659

V.A. Kargin and P.A. Rebinder and Professor S.I Sokolov. There are 22 references, all Soviet (including 5 translations).

TABLE OF CONTENTS:

OPARIN, A.I., akademik, red.; BRAUNSHTEYN, A.Ye., red.; PASYNSKIY, A.G., prof., red.; PAVLOVSKAYA, T.Ye., kand.biolog.nauk, red.; ZHAMEN-SKAYA, M.P., red.izd-va; BUNDEL', A.A., red.izd-va; POLENOVA, T.P., tekhn.red.

[Origin of life on the earth; transactions of the international symposium of August 19-24, 1957, in Moscow] Vozniknovenie zhizni na zemle; trudy mezhdunarodnogo simpoziuma 19-24 avgusta 1957 goda, Moskva. Moskva, Izd-vo Akad.nauk SSSR, 1959. 671 p. (MIRA 12:12)

1. Deystvitel'nyy chlen AMN SSSR (for Braunshteyn).
(LIFE--ORIGIN--CONGRESSES)

PASYNSKIY, A.G.; VIROVETS, O.A.

Effect of ionizing radiation on the oxidation processes in tea leaves. Biokhim.chain.proizv. no.7:200-208 '59. (MIRA 13:5)

1. Institut biokhimii imeni A.N. Bakha AN SSSR, Moskva.
(RADIATION--PHYSIOLOGICAL EFFECT) (TEA) (OXIDATION, PHYSIOLOGICAL)

SHEN PEY-GEN' [Sheng P'ei-ken]; BLYUMENFEL'D, L.A.; KALMANSON, A.E.; PASYNSKIY, A.G.

Electron paramagnetic resonance spectra of biological objects.
Report No.3: Effect of ionizing radiations on nucleic compounds.
Biofizika, 4 no.3:263-274 '59. (MIRA 12:7)

1. Laboratoriya anizotropnykh struktur AN SSSR, Moskva, i Institut biokhimii im. A.N. Bakha AN SSSR, Moskva.
(NUCLEIC ACIDS,
eff. of radiations on electric paramagnetic resonance spectra (Rus))
(RADIATIONS, eff.
on nucleic acid electric paramagnetic resonance spectra (Rus))

VIROVETS, O.A.; PASYNSKIY, A.G.

Effect of ionizing radiations on oxidative processes in tea and tobacco leaves. Biokhimiia 24 no.5:922-928 S-O '59. (MIRA 13:2)

1. Institut biokhimii im. A.N. Bakha Akademii nauk SSSR, Moskva.
(PLANTS, EFFECT OF X RAYS ON) (OXIDATION, PHYSIOLOGICAL)
(TEA) (TOBACCO CURING)

KOMAROVA, L.V.; PASYNSKIY, A.G.

Aggregation of protein molecules in reversible denaturation.
Ukr.biokhim.zhur. 31 no.1:5-11 '59. (MIRA 12:6)

1. Yaroslav Medical Institute, A.N.Bakh Institute of Biochemistry, Moscow.

(PROTEINS)

17 (3,10)

AUTHORS: Virovets, O. A., Pasynskiy, A. G. SOV/20-128-2-52/59

TITLE: Effect of Ionizing Radiation on Oxidation Processes in Leaves of Tea and Tobacco Plants

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 128, Nr 2, pp 407-410 (USSR)

ABSTRACT: The oxidation processes of the tannins and polyphenol substances, as well as the glucosides, are of high importance in the fermentation of tea and tobacco, and greatly determine the quality of the end product. In a usual fermentation, the said processes are a consequence of the effect of various oxidation ferments (of the polyphenol oxidases, etc). Therefore, the possibilities for the influence of ionizing radiation were investigated, especially because they produce, in living cells, a large quantity of radiolysis products of the water - the radicals OH, O_2H and H_2O_2 - all of which are highly oxidizing agents. Thus, a direct oxidation of the substrata under the influence of radiation, as well as a change in the course of fermentative oxidation processes in plant leaves, could be expected. An X-ray irradiation was performed with dosages of

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5000 - 10,000 and 65,000 r/min, respectively. An electron irradiation was carried out at the Institut fizicheskoy khimii AN SSSR (Institute of Physical Chemistry, AS USSR) with a dosage of 3 million r/min. Figures 1 and 2 show the dependence of the radiation effect on the duration and temperature of incubation after irradiation. Table 1 indicates the quantity of oxidized tannin (in %) produced in an incubation of different duration in air and nitrogen. Table 2 shows the effect of the electron bundle on tobacco leaves. The results of the present paper revealed that the tannin oxidation in an irradiated tea leaf is effected by ferments (Fig 1). It is, however, of essential importance that the accumulation of oxidized tannin-forms proceeds in an entire leaf irradiated whereas in the leaf not irradiated no oxidized tannin is present; it only begins to appear when the leaf is pulverized. From this, it is concluded that the ionizing radiation in the entire leaf effects a disturbance of the structural organization. This disturbance favors the contact of the ferment with the substratum, as it is the case in a mechanical destruction of the

tissues. Similar conclusions were drawn from experiments with tobacco leaves (Table 2), although the oxidation processes here proceed more slowly due to a lower moisture during fermentation. At present, the practical utilization of these results is prevented by the deficiency of radiation sources which are strong enough. Professor M. A. Bokuchava and G. S. Il'in helped by giving valuable hints. There are 2 figures, 2 tables, and 3 Soviet references.

ASSOCIATION: Institut biokhimii im. A. N. Bakha Akademii nauk SSSR (Institute of Biochemistry imeni A. N. Bakh of the Academy of Sciences, USSR)

PRESENTED: May 27, 1959, by A. I. Oparin, Academician

SUBMITTED: May 25, 1959

PASYNSKIY, A

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PHASE I BOOK EXPLOITATION SOV/5628

Akademiya nauk SSSR. Institut biologicheskoy fiziki

Rol' perekisey i kisloroda v nachal'nykh stadiyakh radiobiologicheskogo effekta (Role of Peroxides and Oxygen During Primary Stages of Radiobiological Effects) Moscow, 1960. 157 p. 4,500 copies printed.

Responsible Ed.: A. M. Kuzin, Professor; Ed. of Publishing House: K. S. Trincher; Tech. Ed.: P. S. Kashina.

PURPOSE : This collection of articles is intended for scientists in radiobiology and biophysics.

COVERAGE: Reports in the collection deal with the role of peroxides and oxygen in the primary stages of a radiobiological effect. They were presented and discussed at a symposium held December 25-30, 1958, organized by the Institut biofiziki AN SSSR, (Institute of Biophysics, AS USSR). Twenty-eight Moscow scientists, radiobiologists, radiochemists, physicists, and

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physical chemists took an active part in the symposium. Between the time of its conclusion and the publication of the present book some of the materials were expanded. In addition to the authors the following scientists participated in the discussion: L. A. Tummerman, V. S. Tongur, G. M. Frank, Yu. A. Kriger, E. Ya. Grayevskiy, N. N. Demin, B. N. Tarusov, and I. V. Vereshchenskiy. References follow individual articles.

TABLE OF CONTENTS:

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10-6-61

KASATOCHKIN, Vladimir Ivanovich; PASYNSKIY, Anatoliy Germanovich; KUVSHINSKIY, M.N., red.; ZAKHAROVA, A.I., tekhn.red.

[Physical and colloid chemistry] Fizicheskaia i kolloidnaia khimiia. Moskva, Gos.izd-vo med.lit-ry, 1960. 290 p. (MIRA 13:7)

(Colloids) (Chemistry, Physical and theoretical)

PASYNSKIY, A.G.

Role of matrix structures in reproduction phenomena. Biofizika 5 no.1:16-20 '60. (MIRA 13:6)

1. Institut biokhimii imeni A.N. Bakha AN SSSR, Moskva.
(BIOCHEMISTRY)

TONGUR, A.M.; PASYNSKIY, A.G.

Changes in the surface properties of irradiated desoxyribonucleoprotein and desoxyribonucleic acid. Biofizika 5 no. 5:517-522 '60.
(MIRA 13:10)

1. Institut biokhimii imeni A.N. Bakha, Moskva.
(NUCLEOPROTEINS) (DESOXYRIBONUCLEIC ACID)
(X RAYS—PHYSIOLOGICAL EFFECT)

PASYNSKIY, A.G.; DEMIN, N.N.

Basic problems of radiation biochemistry. Biokhimiia 25 no. 3:385-392 My-Je '60. (MIRA 14:4)

(RADIOBIOLOGY)

VOLKOVA, M.S.; KOMAROVA, L.V.; PASYNSKIY, A.G.

Binding of labeled methionine-S^{35} by proteins. Biokhimiia 25 no. 3:422-426 My-Je '60. (MIRA 14:4)

1. Institute of Biochemistry, Academy of Sciences of the U.S.S.R., Moscow, and Medical Institute, Yaroslavl.
(METHIONINE) (PROTEIN METABOLISM)

PAVLOVSKAYA, T.Ye.; PASYNSKIY, A.G.; G[illegible]NIKOVA, A.I.

Production of amino acids by subjection of formaldehyde and ammonium salt solutions to the action of ultraviolet rays in the presence of absorbents. Dokl. AN SSSR 135 no.3:743-746 N '60. (MIRA 13:12)

1. Institut biokhimii im. A.N. Bakha Akademii nauk SSSR. Predstavlen akad. A.I. Oparinym.
(AMINO ACIDS) (ULTRAVIOLET RAYS)

PASYNSKIY, A.G.; PAVLOVSKAYA, T.Ye.

Mechanism of the oxygen effect in radiation oxidation of mercapto croups in cysteine and egg albumin. Dokl. AN SSSR 135 no.4:998-1001 '60. (MIRA 13:11)

1. Institut biokhimii im. A.N.Bakha Akademii nauk SSSR. Predstavleno akademikom A.I.Oparinym.
(Mercapto group) (X rays--Physiological effect)
(Oxygen--Physiological effect)

PASYNSKIY, A.G.

"On the Limitations in Biological Role of Entropy."

report presented at the Intl. Biophysics Congress, Stockholm, Sweden, 31 July - 4 August 1961.

Bakh-Institute of Biochemistry, USSR Academy of Science, Moscow, USSR.

PASYNSKIY, A.G.; DECHEV, G.D.

Excitation of living cells as a shift of steady state of open systems. Izv. AN SSSR. Ser. biol. no.4:497-503 Jl-Ag '61. (MIRA 14:9)

1. Institut biokhimii im. A.N.Bakha AN SSSR, g. Moskva i Biologicheskiy institut Bolgarskoy Akademii nauk, g.Sofiya.
(BIOCHEMISTRY)

PASYNSKIY, A.G.

Role of radiation injury of intracellular interfaces in the biological effect of ionizing radiations. Radiobiologiia 1 no.1:3-9 '61.
(MIRA 14:7)

1. Institut biokhimii im. A.N.Bakha, Moskva.
(RADIATION—PHYSIOLOGICAL EFFECT)

BUDNITSKAYA, Ye.V.; MASLOV, N.M.; BORISOVA, I.G.; PASYNSKIY, A.G.

Impedance method of studying structural changes in plant tissues caused by ionizing radiation. Radiobiologiia 1 no.1:37-41 '61. (MIRA 14:7)

1. Institut biokhimii im. A.N.Bakha AN SSSR i Institut biologicheskoy fiziki AN SSSR, Moskva.

(PLANTS, EFFECT OF RADIATION ON)
(ELECTROPHYSIOLOGY OF PLANTS)

SHEN PEY-GEN'; BLYUMENFEL'D, L.A.; KALMANSON, A.E.; PASYNSKIY, A.G.

Spectra of electronic paramagnetic resonance of biological objects. Part 4: Effect of ionizing radiations on chemically modified and denatured nucleic acid derivatives. Biofizika 6 no.5:534-547 '61. (MIRA 15:3)

1. Institut khimicheskoy fiziki AN SSSR, Moskva i Institut biokhimii imeni A.N. Bakha AN SSSR, Moskva.
(NUCLEIC ACIDS--SPECTRA)
(RADIATION--PHYSIOLOGICAL EFFECT)
(PARAMAGNETIC RESONANCE AND RELAXATION)

PAVLOVSKAYA, T.Ye.; PASYNSKIY, A.G.

Merchanism of the oxygen effect in protein irradiation. Biokhimiia 26 no. 1:110-119 Ja-F '61. (MIRA 14:2)

1. Institute of Biochemistry, Academy of Sciences of the U.S.S.R., Moscow.
(PROTEINS) (X RAYS—PHYSIOLOGICAL EFFECT)
(OXYGEN—PHYSIOLOGICAL EFFECT)

PASYNSKIY, A.G.; VIROVETS, O.A.

Enzymatic decomposition of urea under conditions of an open system. Biokhimiia 26 no.2:332-337 Mr-Ap '61. (MIRA 14:5)

1. Institute of Biochemistry, Academy of Sciences of the U.S.S.R., Moscow.

(UREA)

SLOBODSKAYA, V.P.; PASYNSKIY, A.G.

Dependence of enzyme activity on concentration with regard to their behavior in coacervates. Dokl. AN SSSR 137 no.3:715-718 Mr '61. (MIRA 14:2)

1. Institut biokhimii im. A.N.Bakha AN SSSR. Predstavleno akademikom A.I.Oparinym.

(ENZYMES) (COACERVATES)

PASYNSKIY, A. G. and PAVLOVSKAYA, T. Ye.

"On the Mechanism of of the Effect of Oxygen During Irradiation of Proteins"

paper presented at the Symposium on Biological Effects of Ionizing Radiation at the Molecular Level (IAEA), 2-6 July 1962, Brno, Czech.

PASYNSKIY, A G.

(e)

The Role of Radiation-Induced Damage to Interphases in the Biological Action of Radiation

A. G. Pasynskii, M. S. Volkova, A. M. Tongur and L. M. Komarova

The measurements of dry and moist samples of DNA in an electron microscope show that irradiation not only destroys DNA molecules but also causes them to coil up. The appearance of chemical cross-links in monolayers of DNA disturbs the structure and increases the area of the monolayer. A result of such a radiation-induced disturbance of the organization of the structure of thin surface layers (including nucleic acids) is a conspicuous change of their permeability. A considerable increase of enzymatic reaction rates after irradiation could be shown on a model system in which the enzyme peroxidase and the substrate ascorbic acid were separated by a layer of RNA about 160 Å thick. Similar phenomena are being investigated in systems with lipoproteid interphases. Radiation damage to the structural organization of membranes plays an important role in the disturbance of the oxidation rate of succinic acid by isolated liver mitochondria, and in leaf tissues of various plants (tea, beans, etc.) in which disruption of enzymatic oxidative processes occurs. The changes in intracellular molecular surfaces can be the source of all subsequent biochemical disturbances and of radiation disease in living cells.

Institute of Biological Chemistry, Academy of Sciences, Moscow, USSR

report presented at the 2nd Intl. Congress of Radiation Research,
Harrogate/Yorkshire, Gt. Brit. 5-11 Aug 1962

PASYNSKII, A. G.

(c)

The Mechanism of the Oxygen Effect in Proteins

T. E. Pavlovskaya and A. G. Pasynskii

Institute of Biological Chemistry, Academy of Sciences of the USSR, Moscow

Oxidation of SH-groups was measured to evaluate the oxygen effect in solutions of proteins after X- or γ-irradiation in air, *in vacuo* or in N_2. For cysteine solutions the oxygen effect was explained quantitively by the indirect effect of the radiation. The value of the oxygen effect varied from a maximum of about 3.1 to complete absence for different combination of substrates concentration and radiation dose. A similar variation of the oxygen effect is to be expected for different parts of the cell, and for different criteria of damage. The value of the oxygen effect in protein solutions was largely determined by the hydrogen bonds of the SH-groups. *In vacuo* or N_2, the SH-groups of egg albumen were not oxidized even after high doses (600000 r); when the substance was irradiated in the presence of guanidine *in vacuo* or in air, oxidation of the SH-groups proceeded normally, as it did in solutions of simple thiols. This was evidently the result of the rupture of H-bonds in the protein molecule. When dry preparations of the protein were irradiated, the number of SH-groups oxidized corresponded exactly to the radiation dose, but was almost two orders greater than the number of radicals as measured in the same system by the ESR method.

The irradiated protein absorbs 1–2 O_2 molecules per protein molecule, and the measurements of turbidity show a lower degree of aggregation of the protein irradiated in the presence of O_2. An hypothesis is suggested according to which the oxygen effect is explained by the action of O_2 in the form of either O_2^* or O_2 upon the rupture and rearrangement of several H-bonds in the protein molecules, and upon the conditions of the rupture and rearrangement of intermolecular bridges.

report presented at the 2nd Intl. Congress of Radiation Research,
Harrogate/Yorkshire, Gt. Brit. 5-11 Aug 1962

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S/844/62/000/000/042/129
D214/D307

AUTHORS: Pasynskiy, A. G. and Pavlovskaya, T. Ye.

TITLE: The mechanism of the oxygen effect in the action of ionizing radiation on albumins

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 252-255

TEXT: The O_2-effect in irradiated cysteine and egg albumin was measured as the ratio of -SH groups oxidized in the presence of O_2 and in vacuum. With a high excess of the substrate, the O_2 effect in cysteine solutions (8×10^{-4} - 2.5×10^{-3} M; dose of x or γ rays: 10^4 - 5×10^5 r) reaches the theoretical maximum of 3, falling to unity as the excess is decreased. The oxidation of -SH in a 2% albumin solution occurs only in the presence of O_2. In vacuum, oxidation was obtained in the presence of 4.9 M guanidine which causes a

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The mechanism of ... S/844/62/000/000/042/12
D214/D307

rupture of the H-bond which activates the -SH. The oxidation is intensified on introducing O_2. Exposure of dry albumin to radiation eliminates the indirect action of O_2 (via $HO_2^{\cdot}$). A dose of 10^5 r does not cause oxidation in vacuum, although a dose of 5×10^6 r leads to a 12% oxidation of the -SH, which rises to 24% in an atmosphere of O_2. The action of radiation on O_2 gives O_2^- which ruptures the H-bond and promotes oxidation of -SH. O_2 exhibits the same influence on irradiated nucleic acid, which explains the effect of oxygen in living cells. There are 1 figure and 2 tables.

ASSOCIATION: Institut biokhimii im. A. N. Bakha, AN SSSR (Institute of Biochemistry im. A. N. Bakh, AS USSR)

Card 2/2

PASYNSKIY, A.G.

Apropos of K.S.Trincher's article "Applicability of Prigozhin's theorem in biology". Biofizika 7 no.3:373 '62. (MIRA 15:8)
(EVOLUTION)

PASYNSKIY, A.G., prof.

Some problems of biochemical cybernetics. Vest.AN SSSR 32 no.4:25-31 Ap '62. (MIRA 15:5)
(Biochemistry) (Cybernetics)

PASYNSKIY, A.G.; SLOBODSKAYA, V.P.

Dynamic stability of enzymatic coacervates in substrate solutions. Dokl. AN SSSR 153 no.2:473-476 N '63. (MIRA 16:12)

1. Institut biokhimii im. A.N.Bakha AN SSSR. Predstavleno akademikom A.I.Oparinym.

PASYNSKIY, A.G.
AID Nr. 972-2 21 May

EFFECT OF OXYGEN ON BOUND PIGMENTS IN IRRADIATED PROTEINS (USSR)

Pavlovskaya, T. Ye., and A. G. Pasynskiy. IN: Akademiya nauk SSSR, Doklady, v. 149, no. 4, 1 Apr 1963, 976-978. S/020/63/149/004/025/025

Attempts were made to measure the amount of bound oxygen in nonirradiated human serum albumin and in human serum albumin exposed to a 130,000-r dose of x-rays in vacuum and in air. Malachite green was added to the samples immediately after irradiation. The mean measurement results were as follows:

Serum albumin sample	Molecules of bound pigment per molecule of albumin
Nonirradiated	1.0
Irradiated in vacuum	3.0
Irradiated in air	2.0

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AID Nr. 972-21 21 May

EFFECT OF OXYGEN [Cont'd] S/020/63/149/004/025/025

The observed decrease in the bound pigment content of albumin irradiated in air may be explained by the displacement of pigment by oxygen. Since the decrease in the bound pigment content does not exceed 1 molecule per molecule of albumin, it is assumed that the bound oxygen content of irradiated albumin has a similar value. [AB]

1. Inst. Biochemistry im. A.N. Bakh, Acad. Sci. USSR

Card 2/2

PASYNSKIY, Anatoliy Germanovich; CHERKASOVA, V.I., red.; GRIGORCHUK, L.A., tekhn. red.

[Biophysical chemistry] Biofizicheskaia khimiia. Moskva, Vysshaia shkola, 1963. 432 p. (MIRA 16:9)
(Biophysics) (Biochemistry)

TONGUR, A.M.; ZAYDES, A.L.; PASYNSKIY, A.G.

Study of deoxyribonucleic acid by electron microscopy.
Radiobiologiia 3 no.4:492-493 '63. (MIRA 17:2)

1. Institut biokhimii im. A.N. Bakha AN SSSR, Moskva.

DECHEV, G.D.; MOISEYEVA, L.N.; PASYNSKIY, A.G.

Role of the inhibition of enzymes by reaction products in an open system. Dokl. AN SSSR 151 no.3:725-728 Jl '63. (MIRA 16:9)

1. Institut biokhimii im. A.N.Bakha AN SSSR. Predstavleno akademikom A.I.Oparinym.
(Enzymes) (Inhibition (Chemistry))

ACCESSION NR: AP4015081 S/0205/64/004/001/0029/0035

AUTHOR: Pasynskiy, A. G.; Volkova, M. S.; Komarova, L. V.

TITLE: Effect of radiation damaged nucleoprotein and lipoprotein separating membrane surfaces on enzyme reaction rates

SOURCE: Radiobiologiya, v. 4, no. 1, 1964, 29-35

TOPIC TAGS: radiation damage, nucleoprotein membrane surface, lipoprotein membrane survace, enzyme reaction rate, substrate oxidation rate, dehydrogenation reaction, radiosensitivity, membrane surface permeability, lipoid component, RNA

ABSTRACT: Nucleoprotein and lipoprotein membrane surfaces separating the enzyme from the substrate were studied in a series of experiments. Nucleoprotein membrane surfaces were investigated in irradiated crystalline peroxidase suspensions in which the particles were separated from the ascorbic acid substrate by a thin ribonucleoprotein film (radiation doses not given). Lipoprotein membrane surfaces were investigated in irradiated (20-70 kr doses) artificial lipoprotein complexes and in isolated rat liver mitochondrion suspensions. Enzyme reactions were determined in the peroxidase suspensions and in the

ACCESSION NR: AP4015081

artificial lipoprotein complexes by substrate oxidation rates. In the mitochondrion suspensions a polarographic method was used to determine the dehydrogenation reaction of succinic acid to fumaric acid catalyzed by succinodehydrogenase, a mitochondrion enzyme. Findings show that nucleoprotein membrane surfaces are highly radiosensitive and their enzyme reactions are accelerated by 30-40% as a result of increased permeability of the radiation damaged surfaces. But, lipoprotein membrane surfaces display high radioresistance to doses up to 50 kr and enzyme reactions do not change. Radioresistance of the lipoprotein membrane surface is attributed to its lipoid component which has the capacity to spread out and protect the membrane from increased permeability and other structural damage. Nucleoprotein membrane surface permeability is affected by as few as 1 to 2 ionizations taking place in a membrane surface layer containing over 1,000 RNA molecules. Thus, nucleoprotein membrane surfaces play an important role in the development of biochemical damage in the cell. Orig. art. has: 4 figures.

ASSOCIATION: None

Card 2/3

ACCESSION NR: AP4015081

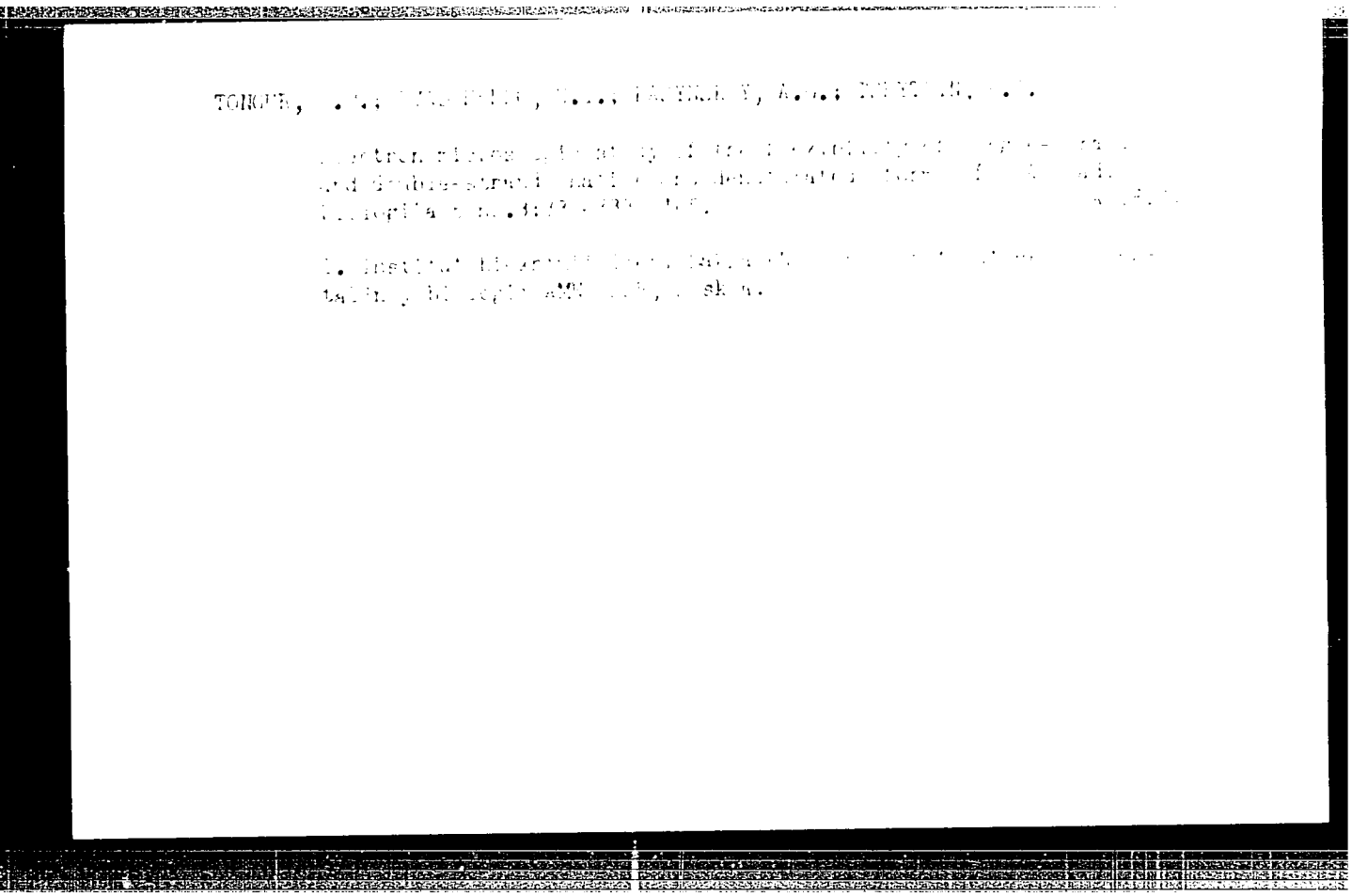
SUBMITTED: 31Jul63	DATE ACQ: 12Mar64	ENCL: 00
SUB CODE: LS	NO REF SOV: 009	OTHER: 006

Card 3/3

PASYNSKIY, A.G.; PAVLOVSKAYA, T.Ye.

Formation of biochemically important compounds during the prebiological stage of earth evolution. Usp. khim. 33 no.10:1198-1215 O '64. (MIRA 17:11)

1. Institut biokhimii imeni A.N. Bakha AN SSSR.



KOZLOV, P.V., otv. red.; ANDRIANOV, K.A., red.; DOGADKIN, B.A., red.; DOLGOPLOSK, V.A., red.; YENIKOLOPYAN, N.S., red.; KARGIN, V.A., red.; KOLESNIKOV, G.S., red.; KOROTKOV, A.A., red.; KORSHAK, V.V., red.; LAZURKIN, Yu.S., red.; MEDVEDEV, S.S., red.; MIKHAYLOV, N.V., red.; PASYNSKIY, A.G., red.; SLONIMSKIY, G.L., red.; SMIRNOV, V.S., red.; TSVETKOV, V.N., red.; FREYMAN-KRUPENSKIY, D.A., tekhn. red.

[Adhesion of polymers] Adgeziia polimerov; sbornik statei. Moskva, Izd-vo AN SSSR, 1963. 142 p. (MIRA 16:10)
(Polymers) (Adhesion)

KOLESNIKOV, G.S., otv. red.; ANDRIANOV, K.A., red.; DOGADKIN, B.A., red.; DOLGOPLOSK, B.A., red.; YENIKOLOPYAN, N.S., red.; KARGIN, V.A., red.; KOZLOV, P.V., red.; KOROTKOV, A.A., red ; KORSHAK, V.V., red.; LAZURKIN, Yu.S., red.; MEDVEDEV, S.S., red.; MIKHAYLOV, N.V., red.; PASYNSKIY, A.G., red.; SLONIMSKIY, G.L., red.; SMIRNOV, V.S., red.; TSVETKOV, V.N., red.; FREYMAN-KRUPENSKIY, D.A., tekhn. red.

[Heterochain high-molecular weight compounds] Geterotsepnye vysokomolekuliarnye soedineniia; sbornik statei. Moskva, Izd-vo "Nauka," 1963. 246 p. (MIRA 17:3)

PASYNSKIY, Anatoliy Germanovich; KARGIN, V.A., akademik, red.; ALAVERDOV, Ya.G., red.; VORONINA, R.K., tekhn. red.

[Colloid chemistry] Kolloidnaia khimiia. Pod red. V.A. Kargina. 2.izd. Moskva, Vysshaia shkola, 1963. 296 p. (MIRA 16:11)

(Colloids)

PASYNSKIY, A.G.

Discussion on papers read at the sessions of the first day of the Symposium. Trudy MOIP. Otd. biol. 7:60-67 '63. (MIRA 16:11)

PASYSHIN, I.I.

Combination of uterine and ectopic pregnancy. Akush. i gin. 32 no.6: 75-76 N-D '56. (MIRA 10:11)

1. Iz Bayram-Aliyskoy gorodskoy bol'nitsy (glavnyy vrach A.A.Kazimov) Turkmenskoy SSR.

(PREGNANCY ECTOPIC, case reports
combination with uterine pregn)
(PREGNANCY
combination of ectopic & uterine)

PASYSHIN, I.I.; BONDARENKO, A.T.

Metallic osteosynthesis of the hip in district hospitals.
Zdrav.Turk. 2 no.5:33-35 S-O '58. (MIRA 12:6)

1. Iz khirurgicheskogo otdeleniya Bayram-Aliyskoy rayonnoy bol'nitsy (glavnyy varch - A.V.Markina).
(HIP JOINT--FRACTURES)

PASYUK, A.S.; GO TSI-TSYAN' [Kuo Ch'i-ch'ien]

Production of carbon, nitrogen, oxygen, neon, and argon ions in a pulse source and their acceleration in a cyclotron. Prib. i tekh. eksp. 10 no.1:28-33 Ja-F '65. (MIRA 18:7)

1. Ob"yedinennyy institut yadernykh issledovaniy.

L 61696-65 EWT(l)/EWT(m)/EPA(sp)-2/EPF(c)/EPA(w)-2/EEC(t)/EWP(t)/EWP(b) Pab-10/
ACCESSION NR: AP5016378 Pr-4/Peb IJP(c) JD/ UR/0120/65/000/003/0042/0045
JG/AT 537.534.2

AUTHOR: Pasyuk, A. S.; Tret'yakov, Yu. P.; Stanku, V.

TITLE: Cathode sputtering in an arc-type ion source

SOURCE: Pribory i tekhnika eksperimenta, no. 3, 1965, 42-45

TOPIC TAGS: cathode sputtering, arc ion source, pulse discharge, particle accelerator

ABSTRACT: The effect of the operating conditions of an arc-type ion source with an oscillating discharge on the rate of cathode sputtering was studied. The source operated in a magnetic field of 5 koe under a vacuum of (0.6—2) 10^{-4} mm Hg. Pulsing frequency of the master oscillator was about 100 cps; pulse duration was about 1 μsec. Discharge voltage and arc current in the pulse were 200—1100 v and 2—40 amp, respectively. The current and voltage pulses were rectangular, with a droop of up to 10%. The cathode material was polycrystalline tungsten with a specific weight of 18.7 g/cm^2. The amount of sputtering was determined by weighing the cathode before and after the experiment. Weight loss was 0.11—1.45 g. The discharge filament and the side of the cathode facing the discharge measured 7 x 7 mm. As a

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L 61696-65

ACCESSION NR: AP5016378

2

result of sputtering, a crater varying in depth to 4 mm formed on the side of the cathode. As the crater grew, the amount of sputtering per unit of time decreased, and the flux density of tungsten particles escaping from the crater increased. The dependence of the cathode sputtering rate on the type of gas fed to the source and arc current and discharge voltage in the pulse were also determined. The conclusions were as follows: 1) Cathode sputtering in an ion source with an oscillating arc and a hot tungsten cathode is caused mainly by tungsten ion bombardment; 2) the rate of cathode sputtering is proportional to the arc current and to the square of the discharge voltage, and, with the exception of oxygen and hydrogen, it depends only to a slight degree on the type of gas used. Orig. art. has: 5 figures and 1 table. [DW]

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

SUBMITTED: 21Apr64 ENCL: 00 SUB CODE: EC

NO REF SOV: 004 OTHER: 009 ATD PRESS: 4039

Card 2/2

L 47085-65 EWT(m)/EPA(w)-2/EWA(m)-2 Pab-10/Pt-7 IJP(c)
ACCESSION NR: AP5007019 S/0120/65/000/001/0028/0033

AUTHOR: Pasyuk, A. S.; Kou, Ch'i-ch'ien

TITLE: Production of carbon, nitrogen, oxygen, neon, and argon ions in an impulse source and their acceleration in cyclotrons

SOURCE: Pribory i tekhnika eksperimenta, no. 1, 1965, 28-33

TOPIC TAGS: ion source, impulse ion source / U-300 cyclotron, U-150 cyclotron

ABSTRACT: On the 3-meter U-300 cyclotron, the effects of (a) the width of the emission slit, (b) location of the gas admission into the gas-discharge chamber, and (c) mode of operation of the source upon the multicharge-ion yield were investigated. The collector probe was set at a 100-cm radius. The ion current practically did not change with slits wider than 2.5 mm. The best results were obtained with the gas admitted near the cathode. Plots of the ion current vs. arc-discharge power, cathode-heating power, and gas pressure are reported. The average A_{40}^{+7} ion current was 5 μa and A_{40}^{+8} current was 0.8 μa. On the 1.5-meter U-150 cyclotron, the effects of the emission-slit length, cyclotron-chamber

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L 47085-65
ACCESSION NR: AP5007019

vacuum, and the source gas upon the ion current were studied. It was found that a slit length over 20 mm has no justification; good vacuum is very important; the results with air, CO_2, CH_4, N, O in the source are tabulated. The average Ne^{+8}_{20} ion current was 1.2 μa and Ne^{+7}_{20} current was 0.01 μa at a radius of 50 cm. "The authors wish to thank G. N. Flerov for his attention to the work with the ion sources and his statement of several of the problems; D. A. Kirzhnits, P. M. Morozov, and B. N. Makov who participated in discussing the results; and V. Stanka for his/her help in operating the U-150." Orig. art. has: 4 figures, 2 formulas, and 5 tables.

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

SUBMITTED: 19Jan64 ENCL: 00 SUB CODE: NP

NO REF SOV: 007 OTHER: 003

Card 2/2

PASYUK, A.S.; SHELAYEV, I.A.; GO TSI-TSYAN' [Kuo Ch'i-ch'ien]; TRET'YAKOV, Yu.P.

Production of multiply charged neon ions in a pulse source for a cyclotron. Prib. i tekh. eksp. 8 no.5:23-25 S-O '63. (MIRA 16:12)

1. Ob"yedinennyy institut yadernykh issledovaniy.

PASYUK A.S.

Distr: 4E3d
3225

STRIPPING REACTION IN THE INTERACTION OF ACCELERATED NITROGEN IONS N^{14} WITH THE NUCLEI OF SOME ELEMENTS. V. V. Volkov, A. S. Pasyuk, and G. N. Flerov (Academy of Sciences, USSR). Zhur. Eksptl'. Teoret. Fiz. 33, 595-601(1957) Sept. (In Russian)

The formation of the radioactive isotope N^{13} was observed when ~ 100 Mev cyclotron accelerated nitrogen ions N^{14} bombarded foils of Al, Ni, Cu, Ag, Sn, and Cd. Measurements of the angular distribution showed that the N^{13} nuclei are emitted in a comparatively narrow angle range. The angle corresponding to maximal intensity increases with Z. If the energy of the bombarding particle exceeds the height of the Coulomb barrier the effective cross section for production of N^{13} will weakly depend on the energy. The cross section is equal to ~ 30 mb for Ni and ~ 12 mb for Al. (tr-auth)

RMX

L 28486-66 EWT(1) AT

ACC NR: AP6013129 SOURCE CODE: UR/0057/66/036/004/0726/0734

51
53
B

AUTHOR: Kul'kina, L.P.; Pasyuk, A.S.

ORG: none

TITLE: Distribution of the relative concentration of atoms and ions along and across the gas discharge in a source of multiply charged ions

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 4, 1966, 726-734

TOPIC TAGS: gas discharge plasma, neon, argon, krypton, ion distribution, ion source, spectrometry

ABSTRACT: The authors have employed a quartz prism spectrograph with photographic recording to measure the intensities of near ultraviolet lines of Ne, Ar, and Kr atoms and singly and doubly charged ions and of Ne and Ar triply charged ions in the reflex discharge of an ion source. The discharge tube was 7 mm square in cross section, 85 mm long between flared ends, and served as the anode. The 7 mm square hot tungsten cathode and the somewhat larger (usually molybdenum) anticathode were mounted some 110 mm apart in the flared ends of the chamber. The discharge tube was provided with three ports near the center for admission of gas. The discharge tube was operated with a gas pressure of 0.001 mm Hg at a potential of 600 V and a current of 10A in the presence of a 5 kOe longitudinal magnetic field. Suitable slots or ports in the wall of the chamber were imaged on the spectrograph slit and in this way the distri-

Card 1/3 UDC: 533.9.07

L 28486-66

ACC NR: AP6013129

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bution throughout the discharge of the intensities of the different lines was measured. The intensity distribution of all the lines due to any one gas, regardless of the state of ionization was the same. The intensities of the lines of all three gases were maximum near the center of the discharge tube, the maxima being slightly closer to the molybdenum anticathode for the heavier atoms (and ions). The argon discharge was examined with molybdenum, copper, and ion anticathodes, and the intensity distributions of lines of the anticathode materials, as well as those of argon, were recorded. These anticathode materials were selected for study because of their different behaviors as regards cathode sputtering. The intensity distribution of the argon lines with the steel anticathode was very similar to their intensity distribution with the molybdenum anticathode. With the copper anticathode, however, the argon maximum was shifted far toward the cathode and the copper lines were appreciable considerably beyond the center of the discharge tube. It is argued that the ion density must be constant along the length of the tube, and the shifts in the positions of the inert gas ion density maxima are ascribed to the influence of sputtered ions of anticathode (and cathode) material. In glow discharges, neither the molecular weight of the inert gas nor the anticathode material affected the line intensity distribution. When gas was admitted to the chamber in the vicinity of the cathode rather than near the center of the discharge tube, the line intensity maximum was shifted toward the cathode. The transverse distribution of line intensity showed a maximum on the axis of the discharge tube. The line intensity decreased with increasing distance from the axis somewhat more rapidly than did the depth of

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sputtering of the cathode surface. This is accounted for by the fact that the depth of sputtering is proportional to the ion density, whereas the line intensity is proportional to the product of the ion density and the electron density, i.e., to the square of the ion density. The authors thank Yu. P.Tret'yakov and Kuo Ch'i-Ch'ien for assisting with the work and Professor A.R.Striganov and G.V.Sholin for discussing the results. Orig. art. has: 1 formula, 8 figures and 3 tables.

SUB CODE: 20 SUBM DATE: 15Mar65 ORIG. REF: 012 OTH REF: 007

FLEROV, G.N.; POLIKANOV, S.M.; KARAMYAN, A.S. [deceased]; PASYUK, A.S.; PARFANOVICH, D.M.; TARANTIN, N.I.; KARNAUKHOV, V.A.; DRUIN, V.A.; VOLKOV, V.V.; SEMCHINOVA, A.M.; OGANESYAN, Yu.TS.; KHAIZEV, V.I.; KHLEBNIKOV, G.I.; MYASOYEDOV, B.F.; GAVRILOV, K.A.

Experiments to produce element No. 102. Zhur. eksp. i teor. fiz. 38 no.1:82-94 Jan '60. (MIRA 14:9)

1. Sotrudniki Ob"edinennogo instituta yadernykh issledovaniy (for Polikanov, Oganesyan, Gavrilov). 2. Sotrudnik Instituta geokhimii i analiticheskoy khimii AN SSSR (for Myasoyedov).
(Transuranium elements)

Pasyuk, A.

SOV/56-36-3-17/71

21(7)
AUTHORS: Volkov, V. I., Gangrskiy, Yu. P., Pasyuk, A. S., Tarantin, N.I., Filippov, E. Y.

TITLE: The Production Cross Sections for Californium Isotopes by the Irradiation of U^{238} With Accelerated Carbon Ions (^{12}C, ^{13}C) (Secheniya obrazovaniya izotopov kalifornii pri obluchenii U^{238} uskorennymi ionami ugleroda)

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1959, Vol 36, Nr 3, pp 762-765 (USSR)

ABSTRACT: In the course of the irradiation of heavy elements with multi-charged ions compound nuclei are formed, which decay again as the result of fission or neutron evaporation. Important conclusions may be drawn with respect to new transuranium synthesis from the ratio of the two decay processes in dependence on the excitation energy and the parameters of the compound nucleus. In the present paper results obtained concerning the energy dependence of the cross sections of the reactions $U^{238}(C^{12}, 4n - 5n)Cf^{246-245}$ $U^{238}(C^{13}, 5n - 6n)Cf^{246-245}$ (cf. also references 1-3) are discussed. The $^{246}Cf^{12}$ and $^{246}Cf^{13}$-ions were accelerated on

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The Production Cross Sections for Californium Isotopes by the Irradiation of U^{238} With Accelerated Carbon Ions

the 15m cyclotron of the AS USSR up to 70 and 84 Mev respectively (with an accuracy of 3%). Energy measurement was carried out by absorption in aluminum, measurement of the ion flux on the target was carried out by means of an integrator (0.2 - 0.3 μa). The results obtained by these measurements are given in figures 1 and 2 in form of diagrams. Figure 3 shows the cross section of the reactions (C^{12}, 4n - 5n) and (C^{13}, 5n - 6n) referred to the total production cross section for the compound nucleus in dependence on excitation energy. Each of the curves shows a characteristic maximum. The shifting of the maximum of the reaction (C^{12}, 5n) towards that of the reaction (C^{13}, 5n) is assumed to be due to an inaccuracy of the energy measurement. For the connection between the decay probabilities and the cross sections it holds that

$\sigma_{xn} = \sigma_c(\Gamma_n/\Gamma_c)^x$

σ_c - total cross section of the neutron emission reaction in the case of a given energy. σ_{xn} - cross section for the formation of a compound nucleus at the same energy. x - average number

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...cross sections for Californium Isotopes by the Irradiation of U^{238} With Accelerated Carbon Ions

of emitted neutrons. Γ_n - probability of neutron emission.

Γ_f - fission probability; ($\bar{\Gamma}$ denotes the mean value)

$\bar{\Gamma}_n/\bar{\Gamma}_f$ for californium is ~1/4 and varies only little in the interval of the excitation energy of 35 - 55 MeV.

Γ_n/Γ_f for Cf^{246}(4n - 5n) is ~1/2 and for Cf^{245}(5n - 6n) ~1/5.

The authors finally thank Professor [illegible] for assistance in the irradiation work, and they also thank the cyclotron team under Yu. P. Gangrskiy and L. K. Tarasov for their collaboration in the technical part of this work. There are 3 figures and 5 references, 3 of which are Soviet.

SUBMITTED: September 15, 1958

Card 3/3

PASYUK, A.S

AUTHORS: Flerov, G. N., Corresponding Member, SOV/20-120-1-18/63
Academy of Sciences, USSR, Polikanov, S. M., Karamyan, A. S., Pasyuk, A. S., Parfanovich, D. M., Tarantin, N. I., Karnaukhov, V. A., Druin, V. A., Volkov, V. V., Semchinova, A. M., Oganesyan, Yu. Ts., Khalizev, V. I., Khlebnikov, G. I.

TITLE: Experiments on the Production of the 102-nd Element (Opyty po polucheniyu 102-go elementa)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 1, pp. 73 - 75 (USSR)

ABSTRACT: The present paper describes the experiments carried out at the Institute of Atomic Energy, AS USSR (Institut atomnoy energii AN SSSR) for finding the new element with the atomic number 102; these experiments were carried out in autumn 1957. First the authors refer to the experiments carried out in the first half of 1957 at the Swedish Nobel Institute (Ref 1). In the experiments of the authors the plutonium isotopes Pu^{239} and Pu^{241} were irradiated with accelerated oxygen ions. Five times charged oxygen ions were by the 150-cm-cyclotron accelerated to 102 MeV. In most cases the ions with the maximum energy were used. The

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PASYUK, A.S.

Distr: 4E3d/4E3c

19 639.17

S316. EXPERIMENTS TO OBTAIN ELEMENT 102. G.N.Flerov, S.M.Polikanov, A.S.Karamyan, A.S.Pasyuk, D.M.Parfanovich, N.I.Tarantin, V.A.Karnaukhov, V.A.Druin, V.V.Volkov, A.M.Semchinova, Yu.Ts.Oganesyan, V.I.Khalkin and G.S.Khlebnikov. Dokl. Akad. Nauk SSSR, Vol. 120, No. 1, 73-5 (1958). In Russian.

19 Plutonium isotopes Pu^{239} and Pu^{241} were irradiated with oxygen ions, accelerated to 103 MeV. The nucleus so produced leaves the target, because of recoil, and is picked up in a collector. This can be moved, in a time of 6-5 sec, over to nuclear emulsions which are designed to register α-particles. Alpha-particles of energy greater than 8.5 MeV are detected. These could come from $Pu^{239,241}(O^{18},4-6n)102^{251-253}$. The total number of α-particles with an energy exceeding 8.5 MeV (those of energy less than 7 MeV could come from platinum contamination) was 18 in the irradiation of Pu^{241} and 6 in the case of Pu^{239}. These figures would give cross-sections for formation of element 102 of 2×10^{-33} and 5×10^{-35} cm^2, respectively. G.E.Drowa

15
2

Pasyuk, A. S.

Distr: 4E3d

3325

STRIPPING REACTION IN THE INTERACTION OF ACCELERATED NITROGEN IONS N^{14} WITH THE NUCLEI OF SOME ELEMENTS. V. V. Volkov, A. S. Pasyuk, and G. N. Flerov (Academy of Sciences, USSR). Zhur. Eksptl'. i Teoret. Fiz. 33, 545-601(1957) Sept. (In Russian)

The formation of the radioactive isotope N^{13} was observed when ~ 100 Mev cyclotron accelerated nitrogen ions N^{14} bombarded foils of Al, Ni, Cu, Ag, Sn, and Cd. Measurements of the angular distribution showed that the N^{13} nuclei are emitted in a comparatively narrow angle range. The angle corresponding to maximal intensity increases with Z. If the energy of the bombarding particle exceeds the height of the Coulomb barrier the effective cross section for production of N^{13} will weakly depend on the energy. The cross section is equal to ~ 30 mb for Ni and ~ 12 mb for Al. (tr-auth)

R.M.X.

Pasyuk A.S.

AUTHORS: Volkov, V.V., Pasyuk, A.S., Flerov, G.N. 56-3-7/59

TITLE: Evaporation Reaction in the Interaction of Accelerated Nitrogen Ions N^{14} with the Nuclei of Some Elements. (Reaktsiya "sryva" pri vzaimodeystvii uskorennykh ionov azota N^{14} s yadrami nekotorykh elementov)

PERIODICAL: Zhurnal Eksperim. i.Teoret.Fiziki, 1957, Vol. 33, Nr 3, pp. 595-601 (USSR)

ABSTRACT: N^{14}- ions are accelerated in the cyclotron up to $\sim$100 MeV, after which they penetrate through Al., Ni, Cu, Ag, Cd, Sn- foils, on which occasion radioactive N^{13} was found.
Measuring of angular distribution showed that N^{13} emerges only within a very narrow angular range. For Al $23^{\circ} \pm 8^{\circ}$ was measured as the most probable angle, where N^{14}- energy amounted to 67 MeV.
The cross section for the evaporation reaction in the case of a N^{14} -energy of $\sim$ 85 MeV amounted to 30 mb for Ni and 12 mb for Al.
There are 5 figures and 2 Slavic references.

ASSOCIATION: AN USSR (Akademiya nauk SSSR)

SUBMITTED: March 19, 1957

AVAILABLE: Library of Congress.

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FLEROV, G. N., [illegible], A. S., VOLKOV, V. V.

(Acad. Sci. USSR)

"Stripping Reaction Produced by the Accelerated Nitrogen Ions on Some Nuclei,"

paper submitted at the A-U Conf. on Nuclear Reactions in Medium and Low Energy Physics, Moscow, 19-27 Nov 57.

OKHRIMOVICH, B.P.; TISHKOV, Yu.Ya.; VASILEVSKIY, F.A.; PASYUK, K.I.

New method of daubing steel-smelting furnace hearths. Ogneupory 27 no.2:81-85 '62. (MIRA 15:3)

1. Zlatoustovskiy metallurgicheskiy zavod (for Okhrimovich, Tishkov). 2. Institut ogneuporov v g. Satke (for Vasilevskiy, Pasyuk).

(Smelting furnaces--Maintenance and repair)

LEVENETS, N.P.; SAMARIN, A.M.; SEMIKIN, I.D.; KAZAKOV, V.E.; BEMBINEK, Ye.I.; PANYUKHNO, L.G.; SVINOLOBOV, N.P.; AVERIN, S.I.; SMIRNOV, V.M.; ZELENSKIY, V.D.; LAYKO, B.G.; TISHCHENKO, O.I.; OKHRIMOVICH, B.P.; DANILOV, A.M.; TISHKOV, Yu.Ya.; PANOV, M.A.; MARKELOV, A.I.; PETROV, A.K.; VASILEVSKIY, P.A.; PASYUK, K.I.; NESTEROV, V.I.; KHRUSTAL'KOV, L.A.; GLAZKOV, V.S.; MAKAGON, V.G.; FOMIN, G.G.; TRISHCHENKO, V.D.; KORZH, V.P.; SUYAROV, D.I.; ARSEYEV, A.V.; PAVLYUCHENKO, A.A.; ZHADAYEV, V.G.; KONDORSKIY, R.I.; MOROZOVA, I.A.; KOCHETOV, V.V.; PRUZHINER, V.L.; MALEVICH, I.A.; MALIOVANOV, D.I.; ZAKOVRYASHIN, I.I.; NOVSKIY, I.S.; NOVIKOVA, V.P.; GRISHIN, K.N.; MOSKOVSKAYA, M.L.; KORNEYEV, B.M.

Inventions. Met. i gornorud. prom. no.3:75-76 My-Je '64.
(MIRA 17:10)

TISHCHENKO, O.I.; OKHRIMOVICH, B.P.; TISHKOV, Yu.Ya.; KULAKOV, I.I.; KHRUSTAL'KOV, L.A.; VASILEVSKIY, P.A.; PASYUK, K.I.

New method of building arc furnace hearths. Metallurg 8 no.2:15-17 F '63. (MIRA 16:2)

1. Zlatoustovskiy metallurgicheskiy zavod i Chelyabinskiy institut ogneuporov.
(Electric furnaces—Design and construction)

[illegible]/000/002/002/004

AUTHORS: Okhrimovich, B. P., Tishkov, Yu. Ya., [illegible]levskiy, P. A., Pasyuk, K. I.

TITLE: New ramming method for hearths of steel furnaces

PERIODICAL: Ogneupory, no. 2, 1962, 61-65

TEXT: Results of experimental and industrial research are given and suggestions are made for repairing rammed bottoms of open hearths and electric steel furnaces by dry magnesite powder. The parameters suited best for the production of rammed hearths of maximum durability were determined in the laboratory. Powdered magnesite of the zavod "Magnezit" ("Magnezit" Plant) was used to study the effects of the grain composition of magnesite powder, thickness of the rammed layer, ramming time and techniques, binding agents, sintering additives, and powder humidity. Since July 1960, experiments of repairing hearths in cold state by pneumatic ramming of dry magnesite powder have been conducted in the steel works of the Zlatoustovskiy metallurgicheskiy zavod (Zlatoust foundry). For repairing hearths in hot state, МПМ(MPM) or МПК(MPK) powders are

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molt[illegible]on t[illegible] the walls and vaults. To increase the d[illegible]sility of hearths of st[illegible]l furnaces especially when melting high-quality steels, the former are p[illegible]duced by ramming dry magnesite powder with a min.mum content of 88% M[illegible]O. The greatest density of the working layer of hearths is obtained by using magnesite powders with a 65-75% content of the 1-0.1 mm fraction, 35-25% of a fraction < 0.1 mm including 25-15% < 0.06 mm. To improve the hearth density without a considerable reduction in refractoriness, up to [illegible]% of titanomagnetite concentrate is added. Ramming and repairing hearths with dry magnesite powder increases their durability considerably and reduces the time of waiting and the consumption of magnesite powder and fuels. To promote the application of the new technique, the production of magnesite powder of the required grain composition will have to be applied, in the "Magnezit" plant. There are 3 tables and 3 Soviet references.

ASSOCIATION: Zlatoustovskiy metallurgicheskiy zavod (Zlatoust Foundry) (Okhrimovich, B. P., Tishkov, Yu. Ya.); Institut ogneuporov v. g. Satke (Institute of Refractories in Satka) (Vasilevskiy, P. A., Pasyuk, K. I.)

PASYUK, N.I.; LEPESHKOV, I.N.

Potassium salt potential of drilling muds of White Russia.
Zhur. neorg. khim. 10 no.3:684-686 Mr '65.
(MIRA 18:7)

PASYUK, N.I. [Pasiuk, M.I.]

Physicochemical characteristics of certain natural waters and salines of White Russia. Vestsi AN BSSR. Ser. fiz.-tekh. nav. no.3:63-65 '63. (MIRA 16:10)

BRETSHNAYDER, S.[Bretsznajder, S.]; YASHCHAK, M.[Jaszczak, M.]; PASYUK, V.[Pasiuk, W.]

Intensification of some processes in the chemical industry by means of vibration. Khim. prom. no.3:211-217 Mr '63. (MIRA 16:4)

1. Varshavskiy politekhnicheskiy institut i Institut fizicheskoy khimii Pol'skoy Akademii nauk.

(Chemical reaction, Rate of)
(Mass transfer) (Vibration)

L 10586-63 EPF(c)/BDS ASD Pr-4 RM/WW/AB

ACCESSION NR: AP3000946 S/0064/63/000/003/0051/0057

AUTHOR: Bretshnayder, S.; Yashchak, M.; Pasyuk, V. 61 59

TITLE: Intensification of several chemical industry processes by means of vibration

SOURCE: Khimicheskaya promyshlennost', no. 3, 1963, 51-57

TOPIC TAGS: vibration, heat transfer, mass transfer, sublimation, absorption

ABSTRACT: The effect of vibration on heat and mass transfer processes was studied. The coefficients of heat transfer and of solid-gas mass transfer (as in sublimation of naphthalene) or solid-liquid mass transfer (solution) increased in comparison to coefficients in stationary systems to a maximum, dependent of course on material, and frequency and amplitude of vibration. In some solutions, however, as in lixivation of a sulfide ore, a 100% maximum was approached and then receded with increased frequency. Liquid-gas mass transfer (absorption) increased with frequency when amplitude was sufficient to cause cavitation in the liquid column. Orig. art. has: 12 figures, 1 table, 3 equations.

ASSOCIATION: Varshavskiy politekhnicheskiy institut i institut fizicheskoy khimii Pol'skoy akademii nauk (Warsaw Polytechnical Inst. and Inst. of Physical Chemistry of the Polish Academy of Sciences)

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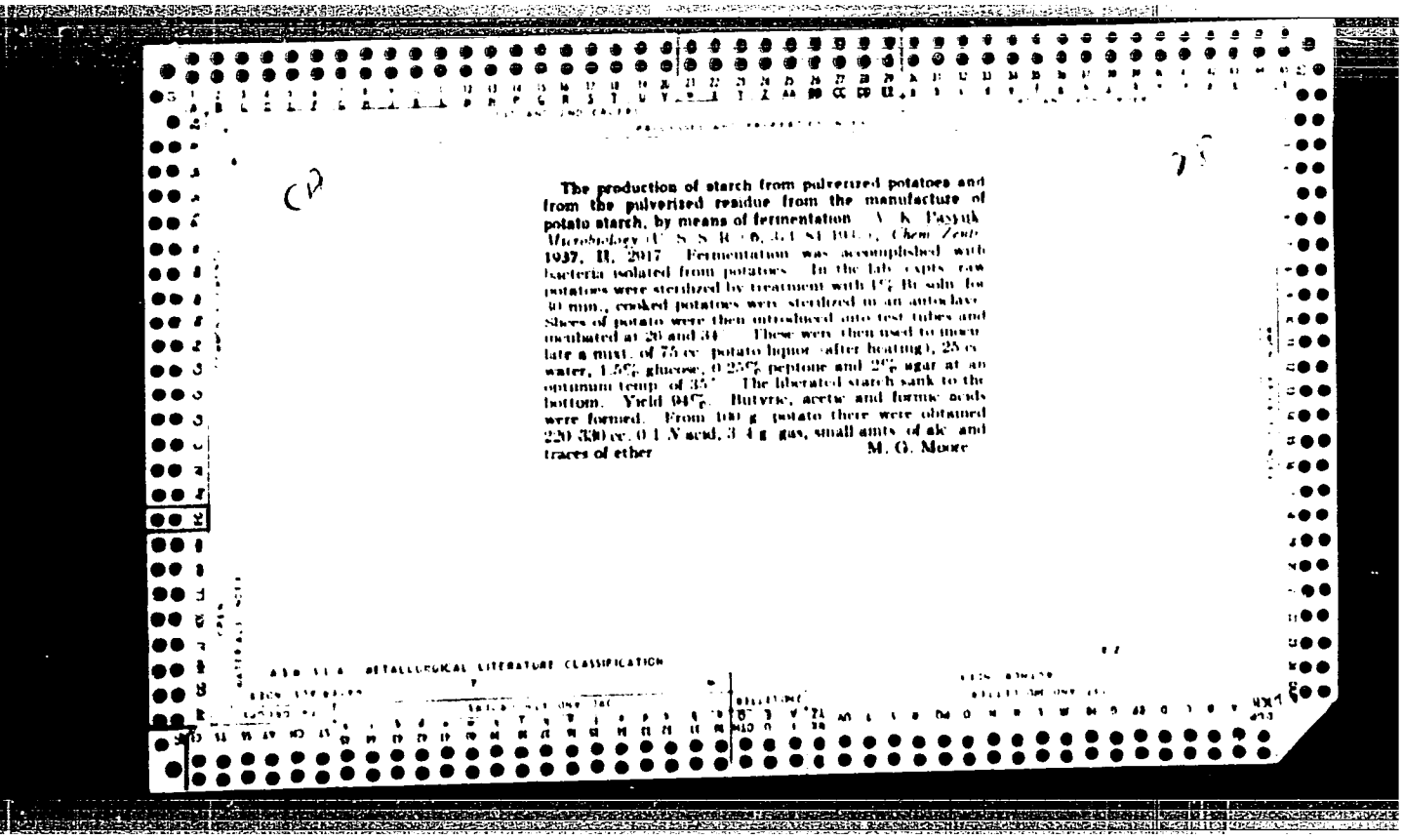

The production of starch from pulverized potatoes and from the pulverized residue from the manufacture of potato starch, by means of fermentation V. K. Pasyuk. *Microbiology* (U. S. S. R.) 6, 3-4, 81-101 (1937). *Chem. Zentr.* 1937, II, 2017. Fermentation was accomplished with bacteria isolated from potatoes. In the lab. expts. raw potatoes were sterilized by treatment with 1% Br soln. for 40 min., cooked potatoes were sterilized in an autoclave. Slices of potato were then introduced into test tubes and incubated at 30 and 34°. These were then used to inoculate a mixt. of 75 cc. potato liquor (after heating), 25 cc. water, 1.5% glucose, 0.25% peptone and 2% agar at an optimum temp. of 35°. The liberated starch sank to the bottom. Yield 94%. Butyric, acetic and formic acids were formed. From 100 g. potato there were obtained 220-330 cc. 0.1 *N* acid, 3-4 g. gas, small amts. of alc. and traces of ether.

M. G. Moore

MAKHNACH, A.S.; PASYUKEVICH, V.I.; SEMENYUK, A.D. [Semaniuk, A.D.]

Narova horizon of the Middle Devonian of the Polotsk region.
Vestsi AN BSSSR Ser. fiz. tekh. nav. no.1:74-82 '64
(MIRA 17:7)

CHEBOTAREVA, N.S.; PASYUKEVICH, V.I.

Role of the relief formation of the Valday ice sheet in the Dvina-Dnieper interfluve. Biul.Kom.chetv.per. no.27:14-20 '62. (MIRA 16:4)

(Western Dvina Valley--Landforms)
(Dnieper Valley--Landforms)

MAKHNACH, A.S.; PASYUKEVICH, V.I.; NEUMERZHYTSKAYA, Z.M.

Some new data on lower Paleozoic deposits in the northwestern part of the Pripet Depression. Vestsi AN BSSR.Ser.fiz.-tekh.nav.no.3:61-70 '56. (MLRA 10:1)

(Pripet Depression--Geology, Stratigraphic)

PASYUKEVICH, V. I.

New information about the early Paleozoic deposits of the northwestern end of the Pripyat massif. A. S. Maklyaev, V. I. Pasyukevich, and Z. M. Nedmerzhytskaya. *Trudy Vses. Neft. Nauch.-Issled. Geol.-Razved. Inst.*, S.S.S.R., *Sb. Pal.-Tekh.* No. 4, 1956, No. 3, 61–76 (Russian summary).—A continuation of the previous investigation (*C.A.* 50, 8969f). R. W.

PASYUKOV, F.V. (g. Pushkin Leningradskoy oblasti)

Organization of medical service for participants in the attack on the Winter Palace. Sov. zdrav. 19 no. 4:63-69 '60.
(MIRA 13:10)

(LENINGRAD--REVOLUTION, 1917-1921--MEDICAL AND SANITARY AFFAIRS)