S/131/61/000/001/004/004
B021/B058

AUTHORS: Nekrasov, K. D. and Salmanov, G. D.

TITLE: Coordination Conference on Heat-resistant Concretes

PERIODICAL: Ogneupory, 1961, No. 1, pp. 44-46

TEXT: By resolution of the Gosstroy SSSR (State Committee on Construction of the Council of Ministers USSR) a Conference on problems of design, construction, and operation of thermal units made from heat-resistant- and reinforced concrete was held at the Nauchno-issledovatel'skiy institut betona i zhelezobetona Akademii stroitel'stva i arkhitektury (AS i A) SSSR (Scientific Research Institute of Concrete and Reinforced Concrete for Construction and Architecture USSR) in October 1960. The Conference was attended by delegates from scientific research and design organizations, plants and schools. K. N. Kartashov, Director of the Institute, opened the Conference. The following reports were delivered: L. D. Solodennikov (Office of State Construction USSR) on problems of the technology and introduction of heat-resistant concretes; A. V. Zotov (Department for Special Work and Assembly of the Gosstroy USSR) on the aspects of the

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Coordination Conference on Heat-resistant
Concretes

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wider application of heat-resistant concretes; K. D. Nekrasov ((NII betona i zhelezobetona) (Scientific Research Institute of Concrete and Reinforced Concrete)) on results of scientific research work in the field of heat-resistant concretes; A. F. Milovanov, from the same Institute, on designs of thermal units from heat-resistant concrete. The rigidity theory of reinforced concrete by V. I. Murashov is mentioned next. The following reports were also delivered: S. S. Serebrennikov ((trest "Soyuzteplostroy") ("Soyuzteplostroy" Trust)) and A. Ye. Issers ((trest "Teplomontazh") ("Teplomontazh" Trust)) on the use of heat-resistant concretes for the construction of industrial furnaces and other thermal units; Ya. V. Klyucharov ((Leningradskiy tekhnologicheskiy institut im. Lensoveta) (Leningrad Technological Institute imeni Lensovet)) on composition and properties of refractory magnesite concrete on the basis of water glass; L. A. Tseytlin (UNIIO) (Ukrainian Scientific Research Institute of Refractory Products) on heat-resistant concretes from pozzuolanic Portland cement; G. G. Fel'dgandler (Gisogneupor) on the use of heat-resistant concretes in a number of branches of industry; B. I. Oborin ((Vsesoyuznyy institut ogneuporov) (All-Union Institute of Refractory Products)) on the prospects of production and use of heat-resistant concrete in the refrac-

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Coordination Conference on Heat-resistant
Concrete

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tory-products industry; N. V. Il'ina (Giprotsement) (State Institute for
the Design and Planning of Establishments of the Cement Industry and
Scientific and Experimental Work in the Field of Cement Production) on
the advantages of concretes for lining rotary furnaces of the cement
industry, compared with refractory bricks; Ye. N. Leve (Ukrainian
Scientific Research Institute of Refractories) on the experiment of using
highly-refractory magnesia concrete for the lining of rotary furnaces for
cement-clinker firing; I. Ya. Zalkind (ORGRES) on boiler immurations by
concrete; S. A. Epshteyn ((Yuzhnyy nauchno-issledovatel'skiy institut
promyshlennogo stroitel'stva AS i A USSR) (Southern Scientific Research
Institute of Industrial Construction of the Academy of Construction and
Architecture UkrSSR)) on heat-resistant concretes on Portland-cement base
and their introduction in the Ukraine; Ya. M. Gamarnik ((Angarskoye
upravleniye Soyuzteplostroya) (Angara Administration of the Soyuzteplo-
stroy)) on the possibility of mechanizing construction work by using
concrete blocks; N. D. Kirichenko (Gipromez) (State All-Union Institute
for the Design and Planning of Metallurgical Plants) on the design of a
blast-furnace air heater from concrete blocks; S. S. Posternak (Giprokoks)
(State All-Union Institute for the Design and Planning of Establishments

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of the By-product Coke Industry) on the use of heat-resistant reinforced concretes for the design of coking-plant foundations; G. I. Zavelev (Gipproneftemash) on the protection of apparatus by heat-resistant concrete linings. The necessity of further studies in the field of heat-resistant concretes for temperatures above 1400°C was underlined in the discussion. Departments for the manufacture of large-size blocks from heat-resistant concrete are to be established in refractory-product plants, first of all at the Nikitovka Combine and at the Semiluki and Domodedovo Plants. The design of a pilot plant for the manufacture of heat-resistant concrete blocks with an annual output of about 50,000 m^3 is to be worked out. Departments for heat-resistant concretes are to be established within the instruction programs of respective institutes and technical schools. The Conference approved of the division of heat-resistant concretes into three classes: 1) highly refractory (above 1770°C); 2) refractory (1580 to 1770°C); 3) heat-resistant (below 1580°C) and recommended that research institutes deal more with the problem of heat-resistant concretes.

Coordination Conference of Heat-resistant Concrete

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ASSOCIATION: Nauchno-issledovatel'skiy institut betona i zhelezobetona Akademii stroitel'stva i arkhitektury SSSR (Scientific Research Institute of Concrete and Reinforced Concrete of the Academy of Construction and Architecture USSR)

Card 5/5

NEKRASOV, K.D.; **SALMANOV, G.D.**

Prospects for the wide utilization of refractory concretes in the construction of thermal aggregates. Ogneupory 26 no.1[illegible]:4[illegible]- 480 '61.
(MIRA 14:11)

1. Nauchno-issledovatel'skiy institut betona i zhelezobetona Akademii stroitel'stva i arkhitektury SSSR.
(Refractory concrete)

[illegible]

FRENKEL', I.M., kand. tekhn. nauk; MIRONOV, S.A., doktor tekhn. nauk, prof.; BARANOV, A.T., kand. tekhn. nauk; BUZHEVICH, G.A., kand. tekhn. nauk; MIKHAYLOV, K.V., kand. tekhn. nauk; MULIN, N.M., kand. tekhn. nauk; KHAYDUKOV, G.K., kand. tekhn. nauk; KORNEV, N.A., kand. tekhn.nauk; TESLER, F.A., kand. tekhn. nauk; BERDICHEVSKIY, G.I., kand. tekhn. nauk; VASIL'YEV, A.P., kand. tekhn. nauk; LYUDKOVSKIY, I.G., kand. tekhn. nauk; SVETOV, A.A., kand. tekhn. nauk; CHINENKOV, Yu.V., kand. tekhn. nauk; BELOBROVYY, .K., inzh.; KLEVTSOV, V.A., inzh.; DOBROMYSLOV, N.S., arkh.; DESOV, A.Ye., doktor tekhn. nauk, prof.; LITVER, S.L., kand. tekhn. nauk; PISHCHIK, M.A., inzh.; SKLYAR, B L., inzh.; POPOV, A.P., kand. tekhn. nauk; NEKRASOV, K.D., doktor tekhn. nauk, prof.; MILOVANOV, A.F., kand. tekhn. nauk; TAL', K.E., kand. tekhn. nauk; KALATUROV, B.A., kand. tekhn. nauk; KARTASHOV, K.N., red.; MAKARICHEV, V.V., kand. tekhn. nauk, red.; YAKUSHEV, A.A., inzh., nauchnyy red.; BEGA, B.A., red. izd-va; NAUMOVA, G.D., tekhn. red.

[Reinforced concrete products; present state and prospects for development] Zhelezobetonnye konstruktsii; sostoianie i perspektivy razvitiia. Pod obshchei red. K.N.Kartashova i V.V.Makaricheva. Moskva, Gosstroiizdat, 1962. 279 p. (MIRA 15:9)

(Continued on next card)

FRENKEL',I.M.---(continued) Card 2.

1. Akademiya stroitel'stva i arkhitektury SSSR. Institut betona
i zhelezobetona, Perovo. 2. Chlen-korrespondent Akademii stroi-
tel'stva i arkhitektury SSSR (for Kartashov). 3. Chlen-korres-
pondent Akademii stroitel'stva i arkhitektury SSSR (for Mironov).
4. Gosudarstvennyy institut tipovogo proyektirovaniya i tekhni-
cheskikh issledovaniy (for Berdichevskiy, Vasil'yev, Lyudkovskiy,
Svetov, Chinenkov, Belobrovyy, Klevtsov, Dobromyslov). 4. Vseso-
yuznyy gosudarstvennyy proyektno-konstruktorskiy institut (for
Desov, Litver, Pishchik).

(Precast concrete)

NEKRASOV, K.D., doktor tekhn. nauk, prof., red.; AL'TSHULER, B.A., kand. tekhn. nauk, red.; MEL'NIKOV, F.I., kand. tekhn. nauk, red.; MILOVANOV, A.F., kand. tekhn. nauk, red.; MILONOV, V.P., kand. tekhn. nauk, red.; SALMANOV, G.D., kand. tekhn. nauk, red.; SASSA, V.S., kand. tekhn. nauk, red.; TARASOVA, A.P., kand. tekhn. nauk, red.; ROGINSKAYA, V.M., kand. tekhn. nauk, red.; TESLENKO, M.K., kand. tekhn. nauk, red.; KUZNETSOVA, M.N., red. izd-va; MOCHALINA, Z.S., tekhn. red.

[Fireproof concrete and reinforced concrete in construction] Zharoupornye beton i zhelezobeton v stroitel'stve; trudy. Moskva, Gos. izd-vo lit-ry po stroit., arkhit.i stroit. materialam, 1962. 301 p. (MIRA 15:5)

1. Vsesoyuznoye soveshchaniye po voprosam issledovaniya, proyektirovaniya, stroitel'stva i ekspluatatsii teplovykh agregatov iz zharoupornykh betona i zhelezobetona, 1960. 2. Nauchno-issledovatel'skiy institut betona i zhelezobetona Akademii stroitel'stva i arkhitektury SSSR (for Nekrasov, Al'tshuler, Mel'nikov, **Milovanov**, Milonov, Salmanov, Sassa, Tarasova).
(Furnaces) (Concrete construction)

NEKRASOV, K.D., prof., doktor tekhn.nauk; MASLENNIKOVA, M.G., inzh.

Heat-resistant perlite concrete. Bet. i zhel.-bet. 8 no.8:339-342 Ag '62. (MIRA 15:9)

(Perlite)

(Lightweight concrete)

NEKRASOV, K.D., inzh.

Warping of parts during heat treatment. Metalloved. i term. obr. met. no.10:57-60 O '62. (MIRA 15:10)
(Steel—Heat treatment) (Deformations (Mechanics))

NEKRASOV, K.D.

New developments in the study and use of fireproof concretes in thermal units. Ogneupory 27 no.11:524-530 '62. (MIRA 15:11)

1. Institut betona i zhelezobetona Akademii stroitel'stva i arkhitektury SSSR.

(Kilns)
(Concrete—Testing)

S/131/63/000/001/002/004
B117/B101

AUTHORS: Nekrasov, K. D., [illegible], Yafayev, I. V., Mamioffe, R. M., Zolotareva, [illegible]

TITLE: Refractory concrete for vacuum distillation furnaces

PERIODICAL: Ogneupory, no. 1, [illegible]

TEXT: For the lining of induction furnaces used to remove zinc from aluminum alloys a refractory concrete of the following composition is proposed: water glass diluted with water, finely ground magnesite-periclase, mixed with sodium fluosilicate; fine- and coarse-grained chamotte as filler. Characteristics of the [illegible] concrete: compression strength 250 - 350 kg/cm^2; refractoriness [illegible]50°C; deformation temperatures at 2 kg/cm^2 load: softening point [illegible], 4% shrinkage at 1320°C; destruction at 1450°C. Thirty changes of the temperature reduce the compression strength of the concrete by 50 - [illegible] when heated up to 850°C. When heated to 1200°C and cooled in water the concrete suffers 25% destruction after five temperature changes. When heated up to 1100°C the compression strength

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Refractory concrete for...

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is 250 - 2[illegible] kg/cm^2 and the [illegible] .64%. Operational test with the new material at the Po[illegible] zavod tsvetnykh metallov (Po[illegible] Plant for Nonferrous Metals) showed the following advantages as compared with magnesite bricks and rammed [illegible]: it took 4 days [illegible] a vacuum distilling furnace, which [illegible] reduction of the usual [illegible] work. After 20 months operation the concrete had become soaked with metal to a depth of 25 - 40 mm only, when the magnesite bricks and rammed [illegible] were completely soaked with metal after 12 - 1[illegible] months only. After 20 months the compression strength was [illegible] - 120 kg/cm^2. Some places showed cracks of up to [illegible] mm width and [illegible] - 60 mm depth filled with metal, which is a disadvantage of the new material. Its high strength has the following causes: magnesite and water glass surround the particles of porous chamotte with a chemically [illegible] coat which prevents impregnation of the concrete by metal. The [illegible] is protected against penetration of the melt into deeper layers by a crust of new formations up to 5 mm thick. By the lining of vacuum distillation furnaces with the new concrete that the Podol'sk Plant for Nonferrous Metals is saving of 15,000 rubles a year. There are 4 figures.

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Refractory concrete for...

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B117/B101

ASSOCIATION: NII betona i zhelezobetona ASiA SSSR (Nekrasov, Sassa, (Scientific Research Institute of Concrete and Reinforced Concrete of the Academy of Construction and Architecture USSR); Podol'skiy zavod tsvetnykh metallov (Yafayev, Mamioffe, Zolotareva) (Podol'sk Plant for Nonferrous Metals)

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NEKRASOV, K.D.; KRIVITSKIY, M.; LISIYENKO, [illegible]; KRITSKIY, G.; ROYZMAN, P.

Heat-resistant air-entrained concrete. Stroitel' 9 no.10:
5-8 O '63. (MIRA 16:11)

1. Nauchno-issledovatel'skiy institut betona i zhelezobetona (for Nekrasov, Krivitskiy, Lisiyenko). 2. Ust'-Kamenogorskoye stroitel'no-montazhnoye upravleniye tresta Soyuzteplostroy (for Kritskiy). 3. Temirtauskiy zavod yacheistogo betona (for Royzman).

NEKRASOV, K.D., prof., doktor tekhn.nauk; MASLENNIKOVA, M.G., kand.tekhn.nauk

Structural heat resistant keramzit concrete on a soluble glass base. Bet.i zhel.-bet. 9 no.12:529-532 D '63. (MIRA 17:2)

NEKRASOV, K.D.; FEDOROV, A.Ye.; YASTRUBINSKIY, V.I.

Determining the moisture content of heat-resistant concrete. Ogneupory 28 no.6:276-278 '63. (MIRA 16:6)

1. Nauchno-issledovatel'skiy institut betona i zhelezobetona Akademii stroitel'stva i arkhitektury SSSR.
(Refractory concrete—Testing)

SHAKHLIN, V.I.; SHUNIN, T.G.; TARASOV, A.F.; KULAKOV, A.M.; IVANOV, [illegible].I.; NEKRASOV, K.D.; SALMANOV, G.D.

Using heat-resistant concrete in the elements of bricklaying of open-hearth furnaces. Ogneupory 28 no.8:364-367 '63. (MIRA 16:9)

1. Magnitogorskiy metallurgicheskiy kombinat (for Shakhlin, Shunin, Tarasov, Kulakov). 2. Magnitogorskiy gorno-metallurgicheskiy institut (for Ivanov). 3. Nauchno-issledovatel'skiy institut betona i zhelezobetona Akademii stroitel'stva i arkhitektury SSSR (for Nekrasov, Salmanov).

NEKRASOV, K.D., doktor tekhn. nauk, prof., red.

[Heat-resistant concrete] Zharostoikie betony. Moskva, Stroiizdat, 1964. 291 p. (MIRA 17:[illegible])

NEKRASOV, K.D.; GOBERIS, S.I.

Restoring structures made of refractory concrete. (MIRA 18:1)
Ogneupory 30 no.6:19-24 '65.

1. Nauchno-issledovatel'skiy institut betona i zhelezobetona Gosstroya SSSR (for Nekrasov). 2. Novosibirskoye spetsializirovannoye upravleniye tresta "Teplomontazh" (for Goberis).

NEKRASOV, K.D.; SALMANOV, G.D.

Introducing to industry the results of scientific research made in the field of heat resistant concrete. Ogneupory 30 no.10:3-4 '65. (MIRA 18:10)

1. Nauchno-issledovatel'skiy institut betona i zhelezobetona Gosstroya SSSR.

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SOV/120-59-5-14/46

AUTHORS: Morozov, A.G., Nekrasov, K.G. and Popov, M.I

TITLE: A Hodoscope Fitted with Small-diameter Counters Fed from a Pulsed Source

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 5, pp 64 - 68 (USSR)

ABSTRACT: Various fillings are used in the counters in order to obtain the best performance. Figure 1 shows how the efficiency P varies with $m = M/M_o$, a parameter specifying what fraction of the electrons produced by an ionizing event is collected by the cathode (m negative) or by the wire (m positive). M specifies the effect of voltages less than that required to initiate a discharge during the interval from t_1 (when the ionising event occurs) to t_2 (when the voltage is sufficient to cause a discharge). Eq (1) gives M in formal form. Similarly, M_o is the effect produced by a voltage sufficient to initiate a discharge in a counter whose

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SOV/120-59-5-14/46

A Hodoscope Fitted with Small-diameter Counters Fed from a Pulsed Source

cathode has a diameter D and whose wire has a diameter d (Eq 2); k/p is the electron mobility in the gas at a pressure p . (The quantity α in Figure 1 is the mean number of electrons left behind in a length equal to the radius of the counter by the ionizing particle.) These curves are used to show, what is surely obvious, that the rise time of the supply pulse should be as short as possible.

Figure 2 shows the pulse-supply source, in which the two thyratrons are hydrogen-filled and give a current rising at 100 A/μsec; the duration of the output pulse is adjustable from 1.5 μsec upwards. The delay varies from 0.2 to 0.4 μsec. A capacitance of 1000 pF attached to the output lengthens the rise time from 3×10^{-8} sec to 5×10^{-8} sec.

Figure 3 shows some results for two counters filled with argon-isopentane; the curves were recorded with 1 500 V pulses lasting 3 μsec, and delayed by 0.3 μsec. Here, V_0

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A Hodoscope Fitted with Small-diameter Counters Fed from a Pulsed Source

is the steady (clearing) voltage applied to the counters. The rise time of the pulse cannot be made much shorter, so these counters are not usable; Figure 4 shows results for counters filled with argon-methylal, used with 2 µsec 1 500 V pulses delayed by 0.7 µsec (counter diameter 9.6 mm). Here, the methylal gives 1/6 of the total gas pressure. This design is also unsuitable. Resort is made to neon, which can be used at high pressures without demanding very high voltages. Figure 5 relates to counters 7.5 mm in diameter and containing neon only at 2 atm, the efficiency (Curve 1) and false count rate (Curves 2) are shown as functions of pulse voltage. Small clearing voltages are effective. Figure 6 gives more details for these counters; the pulse voltage is 1 100 V, the pulse length is 2 µsec, the clearing voltage is shown horizontally and the delay times are, respectively, 0.7, 1.5, 2.5 and 4.5 µsec for Curves 1-4. The parameters finally chosen are -5 V clearing and the shortest delay time. (The efficiency is constant if the product of the clearing voltage and delay

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A Hodoscope Fitted with Small-diameter Counters Fed from a Pulsed Source SOV/120-59-5-14/46

time is constant.)

Figure 7 gives some results for the efficiency as a function of delay time at zero clearing voltage (1 is for neon, 2 is for argon). The table lists the parameters of the counters.

There are 7 figures, 1 table and 7 references, 4 of which are Soviet and 3 English or translations from English.

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

SUBMITTED: September 2, 1958

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L 00060-66 EWT(1)/EWA(h)

ACCESSION NR: AP5021342

UR/0120/65/000/004/0120/0123
621.373.44:539.1.073.2

42

41

B

AUTHOR: Korenchenko, S. M.; Nekrasov, K. G.

TITLE: Pulse generators for spark chamber power supply

25

SOURCE: Pribory i tekhnika eksperimenta, no. 4, 1965, 120-123

TOPIC TAGS: spark chamber, thyratron, pulse generator, nanosecond pulse

ABSTRACT: To improve the time resolution of spark chambers a high voltage pulse must be applied across the chamber electrodes with a shortest possible delay following the passage of the ionizing particle. The charging of the chamber capacitance up to the necessary potential should also be accomplished as quickly as possible. The magnitude of the delay was in the past held down to 120-300 nsec. The present article describes a thyratron generator and control discharger generator circuits for the triggering of large capacity spark chambers. Methods are developed for the shortening of the actuation delays in the high voltage pulse switching circuit down to 30-35 nsec in the case of discharger-containing generators and to 70-80 nsec in the case of thyratron generators. Orig. art. has: 3 figures.

Card 1/2

L 00060-66

ACCESSION NR: AP5021342

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

SUBMITTED: 27Jun64

ENCL: 00

SUB CODE: NP, EE

NO REF SOV: 003

OTHER: 001

Card 2/2 mlb

NEKRASOV, K. P.

Applied Mechanics Reviews
June 1954
Incompressible Flow
Laminar, Viscous

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[illegible]. Nekrasov, K. P., Movement of a cylindrical body in a [illegible] liquid, theory of stabilizing [illegible] (Quasistationary study flow) (in Russian), Prikl. Mat. Mekh. 17, 1, 17-32, Jan.-Feb. 1953. 4

Boundary-layer theory treats only the flow within the boundary layer and determines the points where the boundary layer separates itself from the surface of the obstacle. Boundary-layer theory does not touch the influence of the formation of vorticity, which is necessarily connected with separation of the boundary layer, on the distribution of velocities and pressures outside the boundary layer. The problem of determining the drag and flow around obstacles is, therefore, connected with this problem which is not yet definitely resolved. It can only be resolved by finding the complete solution to the boundary-value problem.

The well-known Oseen solution contains an indefinitely strong vorticity at the boundaries of the wake, which is straight and touches the body tangentially. Zeilon has improved on this disadvantage of Oseen's solution by suppositions which are not entirely acceptable from the hydrodynamic point of view.

In the present report, author determines the drag and flow around an indefinitely long cylindrical body that moves uniformly in a liquid with small viscosity; the direction of motion is perpendicular to the body of axis. No assumptions are made beyond those of small fluid viscosity and weak vorticity in the [illegible] and stream. The wake (as in both the work of Oseen and Zeilon) will be bounded by two rectilinear semi-infinite planes tangential to the body and parallel to the direction of motion. But the vorticity has definite values not only in the wake but also in the boundary layers. By considering the appropriate boundary conditions, the problem is reduced to the solution of an integral equation with a Cauchy-type kernel

Nekrasov

The drag of a circular cylinder is determined on the basis of the author's solution. This has the value C_D = [illegible], which corresponds with experimental results when Re = [illegible] and Re = [illegible]. The calculated value differs from the experimental values in the interval between these Re numbers by approximately [illegible]. It is to be noted that this value of drag coefficient ([illegible]) is between the values which Oseen ([illegible]) and Zeller ([illegible] and [illegible]) have calculated.

M. Strscheletzky, Germany

GORDEYEV, Vasiliy Aleksandrovich; NEKRASOV, Konstantin Pavlovich; VOLKOV, Pavel Vasil'yevich; SIMAKIN, V.V., retsenzent; SOKOLOV, A.F., spets. red.; SIDOROV, Yu.P., spets. red; AKSENOVA, I.I., red.; VINOGRADOVA, G.A., tekhn. red.

[Cotton weaving] Khlopkotkachestvo. Moskva, Izd-vo nauchno-tekhn. lit-ry RSFSR, 1961. 517 p. (MIRA 15:1)
(Cotton weaving) (Looms)

NEKRASOV, K. S.

Journal of Applied Chemistry
Vol. 4 Feb. 1954
Chemical Engineering and
Electrochemical

First results obtained with rotary cement kilns equipped with a water-jacket. K. S. Nekrasov (*Tsement*, 1953, 19, No. 1, 8 13; *Build. Sci. Abstr.*, **1953**, **26**, 167).—A water jacket for the clinkering zone of rotary cement kilns is described. The application of water-cooling to facilitate the formation during cement burning of a protective coating on the kiln refractory lining has been introduced in Russian cement works. Build. Sci. [illegible]

LAGUN, I.I.; NEKRASOV, K.S.; GORELIK, S.G.; KOMAROVSKIY, A.N., doktor tekhn. nauk, prof., nauchnyy red.; YUDINA, L.A., red. izd-va; SHERSTNEVA, N.V., tekhn. red.

[Vibrated brick panels in housing construction] Vibrokirpichnye paneli v zhilishchnom stroitel'stve. Moskva, Gos. izd-vo lit-ry po stroit., arkhit. i stroit. materialam, 1961. 138 p. (MIRA 14:6)
(Brick houses)

NIKITIN, N.V., red.; NEKRASOV, K.S., red.; YASNYY, G.V., inzh., nauchn. red.; [illegible]KOVA, M.S., red.

Roofs for public buildings; Pokrytiia obshchestvennykh zdanii. Pod red. N.V.Nikitina i K.S.Nekrasova. Moskva, Stroiizdat, 1964. 177 p. (MIRA 17:6)

1. TSentral'nyy nauchno-issledovatel'skiy i proyektnyy institut tipovogo i eksperimental'nogo proyektirovaniya zrelishchnykh, sportivnykh i administrativnykh zdaniy i sooruzheniy.

NEKRASOV, K.S.

[illegible]

mineral fertilizers. [illegible] 1965. [illegible]

S/531/62/000/128/002/002
B010/B101

AUTHOR: Nekrasov, L. B.

TITLE: The causes of formation of discrete-coherent type radio echo

SOURCE: Leningrad. Glavnaya geofizicheskaya observatoriya. Trudy. no.128. 1962. Voprosy radiometeorologii. 77-83

TEXT: The purpose of the present investigation was to clarify meteorological conditions favoring the formation of discrete-coherent radio echo and to discuss preliminary results from radar observations of dielectric inhomogeneities performed at the Main Geophysical Observatory. A comprehensive radar installation for meteorological application was regularly employed from January to September 1960 for the probing of the troposphere, and about 100 nephograms were obtained as a result of approximately 500 hours of radar observations. The latter were compared with data of meteorological stations and aircraft probing of the atmosphere. Conclusions. There is a pronounced seasonal variation in the number of the observed radio echo sources. The maximum of the curve occurs between June and July, whereas the first appearances of these

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The causes of formation of discrete- ... S/531/62/000/128/002/002
E010/E101

radio echoes occur in the beginning of May. There is a diurnal variation with the maximum occurring at 13-14 hours Moscow time. There is no correlation between the number of radio echoes and wind velocities at heights of 10-12 m. There is a linear correlation between this number and air temperature at a height of 2 m, which indicates the thermal origin of dielectric inhomogeneities giving rise to discrete-coherent type of radio echo. There is a direct relation between the number of observed radio echoes and the temperatures of the atmospheric layer in which these echoes are detected. In this relation, the most common connections established are as follows: a) maximum numbers of radio echoes are noted at most unstable temperature stratifications; b) clearly pronounced blocking layers restrict the upward spread of radio echo sources; c) near-the-ground inversions are characterized by the complete absence of discrete-coherent radio echoes; d) the effect of cloudiness on the number of radio echoes has no single-valued nature. The maximum numbers are noted at times immediately preceding the appearance of cumuli. This indicates that sources of discrete-coherent radio echoes are determined by convective

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The causes of formation of discrete-... S/531/62/000/128/002/002
E010/E101

transfer of heat and moisture from the underlying surface. Radar observations could be used for studying the thermal convection mechanism and estimating the energy of instability and vertical movements of atmospheric lower layers.
There are 7 figures.

NEKRASOV, L.I.; SKOROKHODOV, I.I.

Existence of a higher peroxide hydrogen. Zhur.fiz.khim.30 no.5:1189-1190 My '56.
(MIRA 9:9)

1.Moskovskiy gosudarstvennyy universitet imeni M.V.Lomonosova.
(Hydrogen peroxide)

NEKRASOV, L. I., KOBOZEV, N. I., and YEREMIN, Ye. N.

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"The Physical Chemistry of Concentrated Ozone; Communication 1 -- Concerning the Synthesis of the Higher Peroxide H_2O_4 With the Aid of Concentrated Ozone," by N. I. Kobozev, L. I. Nekrasov, and Ye. N. Yeremin, Moscow State University, Zhurnal Fizicheskoy Khimii, Vol 30, No 11, Nov 56, pp 2580-2581

The article reports that, although the existence of the radical HO_2 had been established beyond doubt, the question as to whether H_2O_4 exists was still unsolved. In the work described in this instance (which was done in 1951 and submitted for publication on 16 June 1956), the authors bombarded with atomic hydrogen 100% pure liquid ozone condensed at minus 196° C on the walls of the reaction vessel, whereon, according to the authors, the dark-blue film of ozone was transformed into a glasslike transparent substance which had a light-blue tint due to traces of unreacted ozone. This substance was found to decompose at about minus 115°, yielding oxygen and hydrogen peroxide in quantities corresponding to the equation

$$H_2O_4 \longrightarrow H_2O_4 - O_2$$

On the basis of analytical determinations demonstrating this, the authors consider that the stoichiometric composition of the product prepared by them corresponds to the formula H_2O_4.

June 1239

NEKRASOV, L. I. and SKOROKHODOV, I. I.

"Concerning the Problem in Regard to the Existence of a Higher Peroxide of Hydrogen -- Part 1," by L. I. Nekrasov and I. I. Skorokhodov, Chair of Physical Chemistry, Moscow State University, Vestnik Moskovskogo Universiteta, Vol 11, No 1, Jan/Feb 57, pp 213-219

After reviewing USSR and foreign work on the synthesis of H_2O_4 and results obtained in the investigation of products obtained in attempts to synthesize higher peroxides of hydrogen, the authors subject to critical discussion data on the physical and chemical properties of the glass-like product obtained in the low-temperature condensation of dissociated water vapor or dissociated H_2O_2, as well as in the interaction of atomic hydrogen with oxygen. They arrive at the following conclusions:

1. When water vapor or hydrogen peroxide vapor has been dissociated by means of an electric discharge and the product of the dissociation has been condensed on a cold surface (at a temperature of approximately minus 180°), the radical HO_2 is formed, which may either be stabilized by freezing or undergo association, forming the hydrogen superoxide H_2O_4. In addition to that, H_2O_2 and H_2O are formed on the cold surface. The glass-like product consists of H_2O_4, H_2O_2, and H_2O.

2. When the temperature is raised, the glass-like product undergoes a number of transformations. After being originally in an amorphous state, it crystallizes at minus 115° and begins to decompose. At the temperature of minus 61°, when the rate of decomposition reaches a maximum, the product melts, becomes poorer in hydrogen superoxide because of the continuous decomposition of this substance, and is transformed into a solution of hydrogen peroxide in water.

3. The decomposition of the glass-like product, which begins at minus 115°, is due to the reaction

$$H_2O_4 \longrightarrow H_2O_2 + O_2$$

4. To confirm these conclusions and establish beyond doubt the existence of the radical HO_2 and of H_2O_4, more thorough investigations will be necessary.

KOBOZEV, N.I.; SKOROKHODOV, I.I.; NEKRASOV, L.I.; MAKAROVA, Ye.I.

Physical chemistry of concentrated ozone. Part 2: A study of the synthesis of the highest peroxide of hydrogen H_2O_4 by the reaction between concentrated ozone with atomic hydrogen [with summary in English]. Zhur.fiz.khim.31 no.8:1843-1850 Ag '57.
(MIRA 10:12)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
(Peroxides) (Hydrogen) (Ozone)

AFAN[illegible]

AUTHORS: Reznitskiy, L. A., Khomyakov, K. G., [illegible] Nekrasov, L. I., Skorokhodov, I. I.

TITLE: Concerning the Higher Peroxide of Hydrogen and Frozen Radicals I. Determination of the Decomposition Temperature [illegible] Glassy Substances Produced in the Electric Discharge Fr[illegible] Water Vapour (K voprosu o vysshey perikisi v[illegible] zamorozhennykh radikalov. I. Opredeleniye tep[illegible] razlozheniya steklovidnogo veshchestva, poluc[illegible] parov vody v elektricheskom razryade).

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1958, Vol. [illegible]2, Nr [illegible], pp. [illegible] (USSR)

ABSTRACT: The results of the calorimetric determination [illegible] are given, which accompany the decomposition [illegible] substance (obtained from dissociated steam with [illegible] discharge). The method of continuous heating on [illegible] conditions was used. This method makes possible the determination of heat effects in a relatively [illegible] realiable manner. A construction of the calori[illegible] vestigation of the interaction at low temperature [illegible] dissociated in an electric discharge was [illegible] heat effects were determined which accompany the [illegible]

Card 1/4

Concerning the Higher Perodixe of Hydrogen and **Frozen Radicals** 76-1-13/32
I. Determination of the Decomposition Temperature of the
Glassy Substances Produced in the Electric Discharge From
Water Vapour

process of the glassy substance. The authors show [illegible] -115°C the first exothermic effect begins and that it is accompanied by a separation of O_2. At - 70°C the [illegible] substance begins to melt. This goes on till -5[illegible] C. At this temperature the endothermic process passes over [illegible] exothermic one. This is accompanied by a turbulent [illegible] of O_2. It reaches its maximum in a liquid phase at -[illegible]°C. This exothermic effect takes place in the melting [illegible] of the eutectic of the $H_2O-H_2O_2$ system. In order to take this effect into account the heat of fusion of the eutectic was [illegible]. It was 74,5 cal/g. When determining the real value [illegible] second exothermic effect this quantity was taken into account. The authors stated that with the first effect, [illegible] at -115°C and which was accompanied by a separation [illegible] a heat of 78,6 kcal/Mol O_2 was separated. The endothermic effect which is connected with the melting of the [illegible] which begins at -70° is also accompanied by [illegible]

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76-2-13/32

Concerning the Higher Per[illegible] of [illegible] and Frozen Radicals
I. Determination of the [illegible] of
Classy Substances Produced in [illegible]
Water Vapour

[illegible]is. With this effect 100 [illegible] H_2O [illegible] quantity of the second exothermic effect [illegible],0 [illegible] It is accompanied [illegible] of H_2O_2. [illegible]

[illegible]iven here prove the process of the [illegible] of [illegible]assy substances suggested earlier by [illegible] of the authors (Nekrasov) (ref. 6). The endothermic effect [illegible] with this decomposition has not yet been [illegible] to the opinion of the authors this effect [illegible] attributed to a change of [illegible] classy substances, [illegible] in ref. 11.

The authors were [illegible] K[illegible]

There are [illegible] figures, [illegible] are Slavic.

Card [illegible]
3

5(4) SOV/[illegible]

AUTHORS: Skorokhodov, I. I., Nekrasov, L. I., Reznitskiy, L. A., Khomyakov, K. G., Kobozev, [redacted]

TITLE: On the Problem of the Higher Hydrogen Peroxides and Their Radicals . II. Some Notes on the Thermochemistry of the Higher Peroxide H_2O_4 and the Radical HO_2

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 9, pp 2090-2095 (USSR)

ABSTRACT: In a previous paper (Ref 1), calorimetric investigations were described which dealt with the decomposition of the solid condensate (C) obtained by freezing out (at -196°) the steam dissociated in an electric discharge (as a so-called vitreous substance). The two-stage decomposition took place with two exothermic reactions: $HO_2-HO_2 \rightarrow H_2O_2$ (solid)$+O_2$ (1) and H_2O_4(liquid) $\rightarrow H_2O_2$ (liquid)$+O_2$ (2). Detailed checking of the decomposition of (C) (obtained as mentioned above, as well as by a reaction of atomic hydrogen with liquid ozone) indicated that the resultant data need some correction. Visual observations and data obtained by the thermographic method (which

Card 1/3

On the Problem of the Higher Hydrogen Peroxide and Frozen [illegible]
Radicals. II. Some Notes on the Thermochemistry of the Higher Peroxide
H_2O_4 and the Radical HO_2

will be presented in a separate article, it was found that the decomposition of (3) the solid phase vanishes at [illegible], the melting being an endothermic process. Livingston, Ghormley, Zeldes (Ref 8), and A. I. Gorbanev, S. D. Kaytmazov, A. M. Prokhorov, and A. B. Tsentsiper (Ref 9) found that the concentration of the free HO_2-radicals frozen in the (3) amounts to 0.3 per cent by weight only. Hence, it results from [illegible] that the portion of hydrogen represents only [illegible] of the amount of the formed hydrogen, and the first exothermal effect is to be ascribed to the thermal effects of [illegible] and (2) as well as to the crystallization heat of the amorphous portion of the condensate. The author analyzes experimental data on the first thermal effect (Table); the crystallization heat of the amorphous (3)-portion amounts to $\Delta H = -2.6$ kcal/mol H_2O_2, which is near the melting heat of H_2O_2. It is therefore assumed that the devitrification of (3) is directly connected with the presence of H_2O_4 in the condensate.

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On the Problem of the higher Hydrogen Peroxide and Frozen SOV/76-33-9-32/57
Radicals. II. Some Notes on the Thermochemistry of the Higher Peroxide H_2O_4
and the Radical HO_2

The value $\Delta H = -39$ kcal/mol was obtained for the thermal effect of H_2O_4-decomposition in the liquid phase of O_2 and H_2O_2. Herefrom the authors calculated the formation heat for H_2O_4 (from the components) and the re-formation heat of the HO_2-radicals into H_2O_4. The respective values are $\Delta H = -6$ kcal/mol and $\Delta H = -15$ kcal/mol H_2O_4. They are in good agreement with other thermochemical data. The structure H-O-O-O-O-H suggested by A. N. Bakh (Ref 15) is the most suitable for the data obtained. Calculation of the bond energy shows that the energy of the mean O-O bond is found within the range 11-43 kcal if the other bonds are contained in the H_2O_2 molecules according to the corresponding bonds. There are 1 table and 17 references, 8 of which are Soviet.

Card 3/~~4~~
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SOV/76-33-10-45/45

AUTHORS: Kobozev, N. I., Nekrasov, L. I

TITLE: Yevgeniy Nikolayevich Yeremin (On His 50th Birthday)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 10, pp 2387 (USSR)

ABSTRACT:

Ye. N. Yeremin, Professor of Moskovskiy gosudarstvennyy universitet (Moscow State University) and Doctor of Chemical Sciences, celebrated his 50th birthday on January 14, 1959. He is a well-known physicochemist who has obtained important results in the field of gas electrochemistry. In 1930, he graduated from the khimicheskiy fakul'tet Moskovskogo universiteta (Chemical Department of Moscow University) and then worked in various industrial enterprises, institutes and colleges. He completed his first scientific work at the Chernorechenskiy khimicheskiy kombinat (Chernorechenskiy Chemical Kombinat) which dealt with the purification of hydrogen sulphide. At the same time he studied thermodynamic problems of gases in high-temperature processes. In [illegible] Ye. N. Yeremin began to investigate problems of electric oxidation of nitrogen and of the electrocracking of methane gases into acetylene at the Institut azota (Institute for Nitrogen). He has continued this work at the Chemical Department of Moscow

Card 1/[illegible]

Yevgeniy Nikolayevich Yeremin (On His 50th Birthday) SOV/76-33-[illegible]

University. Between 1932 and 1937 he made several investigations concerning the reaction kinetics in electric discharges in co-operation with N. I. Kobozev and S. S. Vasil'yev. Some important results were obtained which partly formed the subject matter of Ye. N. Yeremin's candidate thesis (1937). Results of investigations of the three afore-mentioned authors led to the introduction of a new parameter into gas electrochemistry, namely "specific energy" U/v. In 1949 Ye. N. Yeremin (together with N. I. Kobozev et al.) designed a new apparatus for the electro-cracking of methane into acetylene, and in 1950 he devised a new method used in the electrosynthesis of concentrated nitric acid from air and water. From 1948-1949 onward Yeremin assisted in the research of the electrosynthesis of hydrogen peroxide and ozone carried out at the laboratoriya kataliza i gazovoy elektrokhimii khimicheskogo fakul'teta (Laboratory for Catalysis and Gas Electrochemistry of the Chemical Department), and in co-operation with N. I. Kobozev and L. I. Nekrasov he developed a method used for the preparation of H_2O_4 by bombarding liquid ozone with atomic hydrogen. In 1951 Ye. N. Yeremin completed his doctor thesis at the Chemical Department of Moscow University and since 1952 he has been Professor of the Chair of Physical

Card 2/3

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AUTHORS: Nekrasov, L. I., Kobozev, N. I., Yeremin, Ye. N.

TITLE: Low-temperature reactions of atoms and radicals. Contribution I. Synthesis of hydrogen peroxide from water vapor

PERIODICAL: Vestnik Moskovskogo universiteta. Seriya [illegible], no. 4, 1960, [illegible]-18

TEXT: Attempts have repeatedly been made to obtain hydrogen peroxide by brush discharge in water vapor, and to reach high concentrations by freezing out with liquid nitrogen. The authors have studied the dependence of the yield on feed, water-vapor pressure, design and cooling temperature of the traps, arrangement of the channels between discharge tube and traps, and the intensity of discharge. A report is made here on the influence exerted by design and temperature of the traps. The following conditions were chosen: water vapor pressure, 0.5 mm Hg; amperage, [illegible]155 a; voltage, 1000 to 1200 v. The apparatus is schematically shown in Fig. [illegible]. The [illegible]

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Low-temperature reactions of...

form of trap (Fig. 2 a) proved to be absolutely unsuitable, since much water was separated in the feeding channel. Better results were achieved when the cooled trap was bulged out, and the channel reached only the nitrogen level (Fig. 2, b and v). The best results were achieved when the feeding channel reached as far as below the nitrogen level and was heated by water flowing through at room temperature to avoid ice formation (Fig. 2, g and d). The strict observance of these conditions afforded a 25% molar yield and 60% concentration of hydrogen peroxide. Several diagrams (Figs. 3 to 5) illustrate the dependence of yield on the rate at which the water vapor is fed to the system. No formation of hydrogen peroxide was observed at -70°C. There are 5 figures and 21 references: 7 Soviet-bloc and 14 non-Soviet-bloc. The four references to English-language publications read as follows: Jonas R. A., Winkler C. A. Can. J. Chem., 26, 1010, 1948; Batzold J. S., Luner C., Winkler C. A Can. J. Chem. 31, 262, 1953; Guguere P. A., Secco E. A., Eaton. Disc Faraday Soc. 14, 104, 1953; Kinley Mc. J. Chem. Soc., 77, 5802, 1955.

ASSOCIATION: Kafedra fizicheskoy khimii (Department of Physical Chemistry,

Card 2/12

11.2140

S/076/61/035/003/022/023
B121/206

AUTHORS: Nekrasov, L. I., Skorokhodov, I. I., and Kobozev, N. I.

TITLE: The nature of the peroxide-radical condensates (Answer to P. A. Giguere and D. Chin)

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 3, 1961, [illegible]

TEXT: P. A. Giguere and D. Chin (Ref. 1: J. Chem. Phys., 31, 1695, 1959) doubt that a higher hydrogen peroxide H_2O_4 is formed during peroxide-radical condensation. This assumption is, however, confirmed by various physico-chemical and analytical methods (thermographic, calorimetric, and magnetic investigations). Especially by magnetic investigations it is shown that the peroxide-radical condensate is slightly diamagnetic at temperatures below $-110^{\circ}C$, and that at temperatures above $-110^{\circ}C$ the total magnetic susceptibility increases along with a simultaneous increase of the paramagnetic properties. The increase of the total magnetic susceptibility shows that the liberated oxygen is to be regarded as a decomposition product of the unstable chemical composition H_2O_4. The process in question is therefore not a simple

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The nature of

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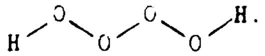
desorption of occluded oxygen. The following chain structure has been assigned to the compound H_2O_4:



The failure of P. A. Giguere to obtain H_2O_4 is explained by the application of solid ozone instead of liquid one. The decomposition of the compound H_2O_4 at a temperature increase proceeds according to the reaction $H_2O_4 \longrightarrow H_2O_2 + O_2$. The mechanism of the reaction of the H atoms with the liquid ozone film is discussed. The radical HO_2 formed on the surface of the liquid ozone according to the reaction O_3 (liquid) + H $\longrightarrow HO_2 + O_2$, diffuses into the ozone film where the reaction $HO_2 + HO_2 \longrightarrow H_2O_4$ (4) takes place. There are 14 references: 8 Soviet-bloc and 6 non-Soviet-bloc. The four most recent references to English-language publications read as follows: P. A. Giguere, D. Chin, J. Chem. Phys., 31, 1685, 1959; R. A. Jones, C. A.

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B12[illegible]/B206

The nature of . .

Winkler, Canad. J. Chem., 29, 1010, 1951; J. S. Batzold, C. Luner, C. A. Winkler, Canad. J. Chem., 31, 262, 1953; J. D. Mc Kinley, D. Garvin, J. Amer. Chem. Soc., 77, 5802, 1955

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

SUBMITTED: September 15, 1960

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Card 3/3

22005

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B106/B201

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AUTHORS: Skorokhodov, I. I., Nekrasov, L. I., Kobozev, N. I., and Makarova, Ye. I.

TITLE: Problem of a higher hydrogen peroxide and frozen radicals

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 4, 1961, [illegible]

TEXT: III. Kinetics of the decomposition of peroxide radical condensate formed from dissociated water vapors

By peroxide radical condensates the authors designate the products formed by freezing out water- and hydrogen peroxide vapors after dissociation in an electric discharge, and also by the reaction of atomic hydrogen with oxygen or liquid ozone at very low temperatures. Data available in the literature concerning the kinetics of decomposition of these peroxide radical condensates with temperature rise contradict one another as to important items (Ref. 6: E. Ohara, J. Chem. Soc. Japan, 61, 569, 1940; Ref. 7: L. I. Nekrasov, Dis. MGU, 1951; Ref. 8: R. A. Jones, C. A. Winkler, Canad. J. Chem., 29, 1010, 1951). For this reason, the authors

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Problem of a higher hydrogen ...

studied the decomposition kinetics of such condensates, which were prepared in an apparatus described earlier (Ref. 5: Zh. fiz. khimii, 31, 1843, 1957; Ref. 11: Zh. fiz. khimii, 32, 87, 1958). The water vapor entered the discharge tube at a rate of 1.4 g/hour and a pressure of 0.5 mm Hg. The discharge amperage was 0.2 a, the voltage 1000-1200 v. The cooling trap was cooled with liquid nitrogen. 0.7-0.8 g were the initial amounts of condensate in all experiments. The condensate composition was the same in all experiments; the molar ratio between oxygen generating from decomposition and remaining hydrogen peroxide was always 0.15, the concentration of H_2O_2 in the final solution was 50 percents by weight. The decomposition of the condensates was studied in an experimental system that had been likewise described earlier. The decomposition of the peroxide radical condensates with slow heating was found to take place essentially in two stages with different temperature coefficients and different activation energies. The first noticeable separation of oxygen takes place between -95 and -70°C for about 17% of the total oxygen formed. The solid condensate starts melting at -70°C; this process comes to an end at -60°C. In this temperature range, and also on a further heating,

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Problem of a higher hydrogen ...

the second more intensive stage of decomposition takes place, at which the chief oxygen amount escapes. The decomposition is completed at -40 to -30°C. Between -110 and -100°C a hardly noticeable step appears in the curve of gas separation, which characterizes a weak decomposition process in which about 3% of the total oxygen is generated. This weak decomposition is accompanied by the disappearance of the yellowish color and by a modification of the condensate structure: the condensate becomes opaque and begins to melt in places. An analysis of the kinetic curve, taken under isothermal conditions, shows the two-stage decomposition reaction in the temperature range -95 to -40°C to be a reaction of first order. The activation energy amounts to 1.2-1.4 kcal for the first stage of decomposition (with condensate in the solid state), but 8.0-9.0 kcal for the second stage of decomposition. The results substantiate the earlier assumption of the higher hydrogen peroxide H_2O_4 being contained in the condensate. The authors reach the conclusion that the assumption put forth by E. Ohara some time ago (Ref. 6) is still the most probable explanation accounting for the results obtained. According to this assumption, the two-stage aspect of the decomposition of the peroxide radical

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Problem of a higher hydrogen ... B106/B201

condensate is due to the decomposition of the H_2O_4 compound, which takes place by different mechanisms in the solid and in the liquid state. Mention is made of Ye. N. Yeremin, who took part in the work of Ref. 7 together with L. I. Nekrasov and N. I. Kobozev. There are 3 figures, 1 table, and 17 references: 7 Soviet-bloc and 10 non-Soviet-bloc. The three most recent references to English language publications read as follows: M. A. P. Hogg, J. E. Spice, J. Chem. Soc., Sept., 3971, 1957; J. A. Gormley, J. Amer. Chem. Soc., 79, 1862, 1957; R. L. Livingston, J. A. Gormley, H. Zeldes, J. Chem. Phys., 24, 483, 1956.

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

SUBMITTED: July 28, 1959

Card 4/4

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refe[illegible] to [illegible] NH_3 [illegible] ment[illegible] s. Ex[illegible] tempe[illegible] according to the equation $NH_2 + NH_2 + M \longrightarrow N_2H_4 + M$ [illegible] hydrazine [illegible] caus[illegible] recombination. D[illegible], where M is a [illegible] N_2H_4 proceeds according to the equations $N_2H_4 \longrightarrow N_2H_4^* \longrightarrow 2NH_2$ (6) and $N_2H_4 + H \longrightarrow NH_2 + NH_3$ [illegible]. Thus, the yield of N_2H_4 depends on several factors [illegible] together [illegible] concentration of NH_2 radicals, which is inversely [illegible] the dissociation of NH_3 (2), [illegible] the concentration of atomic hydrogen, which is directly proportional to the dissociation of NH_3 (3) [illegible] the time [illegible] remain[illegible] the discharge zone. The greater [illegible] the less is the dissociation of N_2H_4. A maximum degree of NH_3 dissociation corresponds to a minimum concentration of NH_2 radicals and to a maximum concentration of atomic hydrogen. Th[illegible] the yield of hydrazine [illegible] a

[illegible]

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Study of the formation of hydrazine during...

minimum with maximum dissociation of NH_3. S. S. Va[illegible] and Ye. N. Yeremin are mentioned. There are [illegible] figures and 14 references: [illegible] Soviet-bloc and 11 non-Soviet-bloc. The 4 most important references to English-language publications read as follows: [illegible] C. Devins, B. Milton, [illegible] Amer. Chem. S[illegible] 76, 2618, 1954; G. W. R[illegible], M. J. McCarty, J. Chem. [illegible], [illegible], [illegible], 1959; K. Ouchi, J. Ele[illegible] Soc. Japan 20, [illegible].

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. L[illegible])

SUBMITTED: July [illegible], [illegible]

Card 4/4

27683
S/076/61/035/009/004/015
B106/B110

11.1510
11.1310

AUTHORS: Skorokhodov, I. I., Nekrasov, L. I., and Kobozev, N. I.

TITLE: The problem of a higher hydrogen peroxide and frozen radicals. V. Thermographic method for studying the decomposition process of peroxide radical condensates

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 9, 1961, 2025 - 2030

TEXT: The decomposition of condensates containing peroxide radicals was studied thermographically. The systems investigated were obtained from water vapors dissociated in an electric discharge, and from the reaction of atomic hydrogen with liquid 100 % ozone at liquid nitrogen temperature. The system obtained from water vapor contained approximately 15 % (by weight) H_2O_4 and considerable amounts of H_2O_2; that from hydrogen and ozone contained up to 60 % H_2O_4 with no H_2O_2. The method of preparation was described previously (Ref 2: N. I. Kobozev, I. I. Skorokhodov, L. I. Nekrasov, Ye. I. Makarova, Zh. fiz. khimii, 31, 1843, 1957; Ref 5: L. A. Reznitskiy, K. G. Khomyakov, L. I. Nekrasov, I. I. Skorokhodov, Zh. fiz.

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Card 1/4

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The problem of a higher hydrogen

khimii, 32, 87, 1957). The thermographic investigation method was similar,
in many respects to the method of differential-thermal rapid analysis
elaborated by G. V. Ravich, [illegible] Tsurinov and V. A. Vol'nova (Ref. [illegible]:
Zavodsk. laboratoriya 19, 862, 1953). Fig. [illegible] shows the block diagram of
the apparatus used. A photorecording Kurnakov pyrometer of the ФПК-55
(FPK-55) type was used for recording the heating curves. Heating was
carried out at a constant rate of 15°/min. Automatic recording was
switched on at -160 to -150°C and was continued for about [illegible] min. The
investigations produced the following results: Independent of the prepa-
ration method, the peroxide radical condensates contain the same compounds
which decompose during temperature increase. The evaluation of thermo-
chemical data (heat effects of 34 - 36 Kcal/mole O_2 at decomposition
temperatures >-55°C) showed that the decomposing compound is the higher
hydrogen peroxide H_2O_4, which agrees with the data in Ref. 6 (I. I.
Skorokhodov, L. I. Nekrasov, L. A. Reznitskiy, K. G. Khomyakov, N. I.
Kobozev, Zh. fiz. khimii, 33, 2090, 1959). The differences in the thermo-
grams of the two systems investigated are based on the following fact:
The condensate produced from dissociated water vapor is of disordered
structure, and crystallizes at -[illegible]0 to -70°C. The hydrogen peroxide in
Card 2/4

27683
S/076/61/035/009/006/015
B106/B110

The problem of a higher hydrogen ..

the condensate is responsible for crystallization. During heating in the temperature range of from -110 to -75°C, the heat of crystallization of the amorphous part of the condensate appears, therefore, besides the chemically conditioned thermal effects. On the other hand, the condensate from the reaction of atomic hydrogen with liquid ozone before decomposition contains no hydrogen peroxide, and is of crystalline structure. In this case, no heat of crystallization, only chemically conditioned thermal effects appear. The good agreement of values for ΔH calculated from thermograms with data obtained calorimetrically shows that the thermographic method may be successfully applied to the investigation of frozen systems containing radical and metastable compounds. The authors thank Ye. I. Makarova for conducting the chemical analyses. L. G. Berg and V. Ya. Anosov (Ref. 7: Zh. obshch. khimii, 12, 32, 1942) are mentioned. There are 4 figures, 1 table, and 10 references: 8 Soviet and 2 non-Soviet-bloc. The reference to the English-language publication reads as follows: R. A. Jones, C. A. Winkler, Canad. J. Chem., 29, 1010, 1951.

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

Card 3/4

[illegible]
11191

S/189/62/000/003/001/001
B214/B307

AUTHORS: Nekrasov, L.I., Kobozev, N.I., and Yeremin, Ye.N.

TITLE: Low temperature reactions of atoms and radicals (report II). The interaction of atomic hydrogen with H_2O_2

PERIODICAL: Moscow. Universitet. Vestnik. Seriya II, Khimiya, no. 3, 1962, 24 - 25

TEXT: The reactions of atomic hydrogen with H_2O_2 in the vapor and solid states were studied at -196° C to explain the mechanism of dissociation of H_2O vapor induced by an electric discharge. This reaction only occurs in the gas phase, when an almost complete conversion of H_2O_2 into H_2O is achieved. The mechanism is described by $H_2O_2 + H \longrightarrow H_2O + OH + 45$ Kcal. and $OH + H \longrightarrow H_2O + 114.5$ Kcal. The absence of a reaction between H atoms and solid H_2O_2 is attributed

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Low temperature reactions ... S/189/62/000/003/001/[illegible]
D214/D307

to the inability of the H atoms to reach the inner layers of the solid. There is 1 table.

ASSOCIATION: Kafedra fizicheskoy khimii (Physical Chemistry Department)

SUBMITTED: February 7, 1961

Card 2/2

[illegible]

[illegible] te, V. V., Nekrasov [illegible], Terent'yev, A. [illegible]
[illegible] urasire, Ye. G.

[illegible] in the series of chelate polymers. II. [illegible]
[illegible] physicochemical properties of chelate polymers [illegible]
[illegible] tetr[illegible]ne[illegible] [illegible]

[illegible] Vysokomolekulyarnyye soyedineniya, v. [illegible]

[illegible] chelate polymers [illegible]

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4

32342

Studies in the series of ... S/190/62/004/001/003/020
B101/B110

spectra of chelates were recorded. Absorption maxima (reflection minima were close to the values for the corresponding monomers. Luminescence (in a decreasing sequence) was observed in compounds with Zn, Cd, Ni, Co, and Cu. Fe compounds did not luminesce. According to Faraday, magnetic susceptibility was determined at 7000 oe by a torsion balance. Zn and Cd chelates proved to be diamagnetic; Cu, Fe, and Co chelates were paramagnetic, those of nickel with R = 2H- and $-(CH_2)_6-$ were paramagnetic while chelates with R = $-(CH_2)_2-$ and $o-C_6H_4-$ were diamagnetic. χ_M for Zn was -123.1 with R = 2H-, and -153.1 with R = $-(CH_2)_2-$; -169.3 ($-(CH_2)_6-$, -194.1 ($o-C_6H_4-$). The values for Cd are as follows: -160.2 ($-(CH_2)_2-$); -200.7 ($-(CH_2)_6-$), and -220.0 ($o-C_6H_4-$); for Ni: -158.4 ($-(CH_2)_2-$), and -178.2 ($o-C_6H_4-$). Magnetic moments of the paramagnetic compounds expressed in μ_B have the following values: for Ni 2.51, with R = 2H-; 3.47 with $-(CH_2)_6-$; for Cu, 1.79 with 2H-; 1.62 with $-(CH_2)_2-$, 1.43 with

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Studies in the series of ...

S/190/62/004/001/003/020
B101/B110

$-(CH_2)_6-$, and 1.45 with $o-C_6H_4-$; for Fe (in the same sequence of substituents) 5.32, 3.66, 5.09, 3.72; for Co: 4.01, 4.13, 5.25, and [illegible]. A plane configuration of nodes is assumed for diamagnetic Ni chelates and a tetrahedral one for paramagnetic chelates. In the presence of the [illegible] and third substituents, Fe forms a tetrahedral, in the presence of the two other substituents, however, it forms a plane configuration. The Co chelate with R = $-(CH_2)_6-$ is tetrahedral. μ_B values of the other Co compounds indicate a combination of plane and tetrahedral nodes. An epr resonance was observed in Cu compounds only. The g factor decreased parallel to the μ_B value. N. I. Kobozev and V. B. Golubev are thanked for discussion. There are 3 figures, 6 tables, and 4 references: 3 Soviet and 1 non-Soviet. The reference to the English-language publication reads as follows: A. E. Martell, M. Calvin, Chemistry of the metal chelate compounds, New York, 1953.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova

Card 4/4

NEKRASOV, L.I.; KOBOZEV, N.I.; KOMISSAROV, G.G.

Effect of the maximum absorption of chlorophyll in a completely formed adsorption monolayer. Vest.Mosk.un.Ser.2: Khim. 17 no.2:31-32 Mr-Ap '62. (MIRA 15:4)

1. Kafedra fizicheskoy khimii Moskovskogo universiteta.
(Chlorophyll) (Adsorption)

S/189/62/000/006/001/006
D214/D307

AUTHORS: **Nekrasov, L.I.**, Kobozev, N.I. and Komissarov, G.G.

TITLE: Magnetic and optical properties of chlorophyll adsorbed on caprone

PERIODICAL: Moscow, Universitet. Vestnik. Seriya II. Khimiya, no. 6, 1962, 36-38

TEXT: This is a study of the adsorption of chlorophyll on to a powdered caprone and of the magnetic and optical properties of the adsorbed pigment. The adsorbed isotherm, which exhibits two distinct stages, is similar to the isotherms obtained previously for chlorophyll adsorbed on alumina and silica gels. Initially, the pigment molecules are adsorbed by their flat sides (first stage); on further adsorption they begin either to form multilayers or to reorientate themselves into an edgewise position (2nd stage). Magnetic susceptibility measurements show the adsorbed chlorophyll to be paramagnetic. As the surface concentration of the pigment (a) increases, the susceptibility decreases to a minimum and rises again.

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Magnetic and optical ... S/109/62/000/006/001/006
D214/D307

The minimum susceptibility corresponds to a at which multilayers begin to form or reorientation sets in (a ~ 0.45 μm/g). The coefficient of reflection (R) falls sharply as a increases (λ = 665-667 mμ) up to the point where multilayers or reorientation begin. At higher surface concentrations, an increase in a reduces R slightly. There are 3 figures.

ASSOCIATION: Kafedra fizicheskoy khimii (Department of Physical Chemistry)

SUBMITTED: August 14, 1961

S/189/62/000/006/006/006
D214/D307

AUTHOR: Nekrasov, L.I.

TITLE: The electron paramagnetic resonance of adsorbed chlorophyll

PERIODICAL: Moscow. Universitet. Vestnik. Seriya II. Khimiya, no. 6, 1962, 73-74

TEXT: The EPR spectra of chlorophyll adsorbed on alumina gel (specific surface ~ $50m^2$; mean particle diameter = 5×10^{-4} cm; mean pore radius = 50 Å) were recorded at 25°C. The peaks of the signal obtained from a specimen in total darkness had the same separation (14 gauss) as those obtained from the same specimen illuminated by 500 watts for 30 mins. The g factor was 2.0021. The concentration of the adsorbed pigment was 94.0 μ moles/g alumina, i.e. multilayers are present. There is 1 figure.

ASSOCIATION: Kafedra fizicheskoy khimii (Department of Physical Chemistry)

SUBMITTED: July 13, 1962

Card 1/1

[illegible]

[illegible]

[illegible]

11 1510

AUTHORS: [illegible] Yevi[illegible]

TITLE: The [illegible] [illegible]

PERIODICAL: [illegible]

ABSTRACT: The synthesis of the [illegible] from [illegible] vapor or in reaction between [illegible] and atomic hydrogen [illegible] been studied by the [illegible] method. The [illegible] to check published data (Ref. 1, see rel *; Ref. 2, A. [illegible] Kartmazov, A. M. [illegible]; Ref. 3, see rel * [illegible] S. D. [illegible], A. V. [illegible] Fiz. khimii, 34, [illegible], 19[illegible]) and to establish the maximum [illegible] possible. The resonance spectra [illegible] exhibit asymmetric maxima at [illegible] sec, irrespective of the [illegible] synthesis. The asymmetry is due to the [illegible]

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26

[illegible]

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[illegible]
[illegible]
etc., [illegible]
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[illegible]

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[illegible]

obtained fr[illegible]
references [illegible]
references [illegible]
[illegible]
[illegible] Ref. [illegible]
Rev., [illegible]
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B11[illegible]/B1[illegible]1

// 1120
// 1310
// 1190

AUTHORS: Skorokhodov, I. [illegible], Nekrasov, L. I., K[illegible]ev, [illegible] Yevdokimov, V. F. (Moscow)

TITLE: Problem of higher peroxides of hydrogen and free rad[illegible]. II. Investigation of the magnetic properties of free radical condensates

PERIODICAL: Zhurnal fizicheskoy khimii, v. 3[illegible], no. [illegible], [illegible], [illegible]

TEXT: The authors studied the magnetic properties of peroxide radical condensates synthesized both from dissociated water vapors and from the reaction of atomic hydrogen with liquid O_2 by a method already described (Zh. fiz. khimii, [illegible]1, 184[illegible], 1[illegible]; ibid., [illegible]2, [illegible], [illegible]). The magnetic susceptibility was determined by the method of [illegible] with water as gauge substance (measurement of weight increase in the magnetic field) between -150 and +20°C. Below -110°C, peroxide radical condensates are weakly diamagnetic; their susceptibility is -0.1 [illegible] cgsm. The paramagnetism of the system increases with the temperature owing to free oxygen (neither absorbed nor occluded) forming from

Card ①/2

33691

[illegible]

Problem of [illegible] peroxides... [illegible] 11 [illegible] 1

[illegible] H_2O_4 [illegible] condensate [illegible] composition. [illegible] H_2O_4 is estimated to be [illegible] (4 - 6)·10 [illegible]. From the [illegible] mentioned, H_2O_4 (H-O-[illegible]-O-H), is assumed to be a [illegible] and saturated with respect to its valence. A paper by [illegible] B. Neyman, [illegible] Kazarn[illegible] (D. AN SSSR, 74, [illegible]) is mentioned. There are [illegible] figures and [illegible] references: 11 Soviet and [illegible] non-Soviet. The four most recent references to English-language publications read as follows. [illegible] Livingston, [illegible] Gardner, [illegible] Zeldes, J. Chem. Phys., 24, [illegible]; [illegible] Foner, [illegible] L. Cochran, [illegible] Bowers, Phys. Rev., 112, [illegible]; [illegible] Gibson, [illegible], J. Chem. Phys., 21, 168[illegible]; [illegible] J. Chem. Soc., [illegible]; [illegible] 21, [illegible]; [illegible] 22, [illegible].

ASSOCIATION: Moskovskiy [illegible] universitet [illegible] (Moscow State University imeni [illegible])

SUBMITTED: April [illegible], 19[illegible]

Card 2/2

S/189/63/000/002/003/010
A057/A126

AUTHORS: Nekrasov, L.I., Kobosev, N.I., Yeremin, Ye.N.

TITLE: Low-temperature reactions of atoms and radicals. Communication III. Dissociation of water vapors in an electric glow discharge

PERIODICAL: Vestnik Moskovskogo universiteta, Seriya II, Khimiya, no. 2, 1963, 17 - 19

TEXT: The authors demonstrated in an earlier paper (Vestn. Mosk. un-ta, ser. Khimii, no. 12, 1960, 12) the effect of the construction and temperature of the collector for the products upon the dissociation of water vapor in a glow discharge. The effect was controlled by the yield and concentration of hydrogen peroxide and the yield of water, hydrogen and oxygen. In continuation of these studies, the effect of flow rate and pressure on the H_2O dissociation and the following reactions were investigated in the present work. The same apparatus and technique were used as in the former work. The results obtained on the effect of the vapor pressure are in good agreement with data presented by W.K. Rodebush et al. (J. Am. Chem. Soc., v.59, 1939, 1984) showing a decrease of the peroxide

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S/189/63/000/002/003/010
A057/A126

Low-temperature reactions of atoms and ....

yield with rising pressure (from 0.3 to 1.5 torr) and no considerable change of the water yield. In correspondence with the obtained kinetic curves of the yield the authors assume three principal stages in the reaction: In the first stage there occurs a dissociation of water vapors in the electric discharge, in the second a recombination of the atoms and radicals, whose transformations occur in the third stage directly on the cooled surface of the collector. There are 3 figures.

ASSOCIATION: Kafedra fizicheskoy khimii (Department of Physical Chemistry)

SUBMITTED: March 23, 1961

Card 2/2

ACCESSION NR: AT4028330 S/0000/63/000/000/0041/0045

AUTHOR: Kobozev, N. I.; Nekrasov, L. I.; Skorokhodov, I. I.

TITLE: Mechanism of low temperature formation of hydrogen peroxide

SOURCE: Soveshchaniye po khimii perekisny*kh soyedineniy. Second, Moscow, 1961. Khimiya perekisny*kh soyedineniy (chemistry of peroxide compounds); Doklady* soveshchaniy. Moscow, Izd-vo AN SSSR, 1963, 41-45

TOPIC TAGS: hydrogen peroxide, low temperature formation, nascent hydrogen, ozone, oxygen, hydrogen, hydroxyl radical, water

ABSTRACT: This paper proposes a scheme for low temperature reactions of atomic hydrogen with oxygen. The authors explain the research of interaction of nascent hydrogen with oxygen at low temperatures with the formation of hydrogen peroxide and water as a final product. The paper claims that, in addition to water and hydrogen peroxide, the primary products also contain free frozen HO_2 radicals and H_2O_4 compound, the higher peroxide of hydrogen. The concentration of HO_2 radicals in condensates is small and in the best cases attains only 0.4 wt-%. The HO_2 and H_2O_4 radicals can be maintained only at temperatures of less than -120°C. At higher temperatures the latter break down into hydrogen peroxide and oxygen. If hydrogen

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ACCESSION NR: AT4028330

peroxide is formed in the heterogeneous mechanism through the HO_2 radical, then the formation of water occurs basically in the gaseous phase or through OH radicals or oxygen atoms. The proposed scheme reflects the basic outlines of the process of hydrogen peroxide formation at low temperatures.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: 13Dec63 DATE ACQ: 06Apr64 ENCL: 00

SUB CODE: CH NO REF SOV: 009 OTHER: 017

Card 2/2

YAGODOVSKAYA, T.V.; NEKRASOV, L.I.

Infrared absorption spectrum of the products of glow discharge in oxygen.
Zhur.fiz.khim. 37 no.10:2347-2349 O '63. MIRA 17:2

1. Moskovskiy gosudarstvennyy universitet.

KOMISSAROV, G.G.; KOBOZEV, N.I.; NEKRASOV, L.I.

Luminescence of chlorophyll adsorbed on capron. Zhur. fiz. khim. 37 no.11:2555-2556 N'63. (MIRA 17:2)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

MAL'TSEV, Yu.A.; SKOROKHODOV, I.I.; NEKRASOV, L.I.

Hydrogen superoxide and frozen radicals. Part 7. Zhur. fiz. khim. 37 no.12:2740-2745 D '63. (MIRA 17:1)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.

KOMISSAROV, G.G.; GAVRILOVA, V.A.; NEKRASOV, L.I.; KOBOZEV, N.I.;
YEVSTIGNEYEV, V.B.

Photosensitizing activity of chlorophyll adsorbed on capron as related to the surface concentration. Dokl. AN SSSR 150 no.1:174-175 My '63. (MIRA 16:5)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova i Institut biokhimii im. A.N.Bakha AN SSSR. Predstavleno akademikom A.N.Tereninym.

(Chlorophyll) (Nylon) (Photosynthesis)

ACCESSION NR: AP4042476 S/0217/64/009/004/0428/0433

AUTHOR: Komissarov, G. G.; Kobozev, N. I.; Nekrasov, L. I.; Tsy*rul'nikov, P. G.

TITLE: Magnetic and optical properties of beta carotene adsorbed on magnesium oxide

SOURCE: Biofizika, v. 9, no. 4, 1964, 428-433

TOPIC TAGS: carotene, chlorophyll, photosynthesis pigments, adsorbed carotene, magnesium oxide, magnesium oxide adsorbent, pigment adsorbent system, carotene magnetic property, carotene optical property, paramagnetic carotene

ABSTRACT: The properties of carotene adsorbed on MgO were studied as a model system by means of optical and magnetic methods. The ultimate purpose of the study was to further investigate the more complicated model systems of two photosynthesis pigments — chlorophyll and carotene — adsorbed on the same carrier. Pure β-carotene (free from other isomers) was adsorbed on analytically pure MgO from a

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ACCESSION NR: AP4042476

petroleum ether (b.p., 85—95C) solution. A special test indicated that the MgO used was free from ferromagnetic impurities. The carotene adsorption isotherm obtained indicated that a monolayer of flat carotene molecules is formed at the saturation stage; each molecule occupies approximately 120 Å^2. It was found that the adsorbed carotene is paramagnetic, while carotene deposited on MgO by evaporation of the solution is diamagnetic. It was proved that this paramagnetic effect is caused by oxygen from the ambient air. However, the details of the process are not clear and require further investigation. The optical studies indicated that, unlike chlorophyll, the adsorbed carotene undergoes a shift of the maximum of diffuse reflection to the long-wave end of the spectrum by 10—15 mu. The dependence of the coefficient of diffuse reflection (at a wave length of 461 to 468 mμ), and of the specific optical density upon the surface concentration of the adsorbed β-carotene is gradual, in contrast to the step-shaped curve of chlorophyll obtained in previous studies. Orig. art. has: 4 figures.

ASSOCIATION: Moskovskiy gosudarstvenny*y universitet im. M. V. Lomonosova (Moscow State University)

Card 2/3

ACCESSION NR: AP4042476

SUBMITTED: 30Jan63 ATD PRESS: 3069 ENCL: 00

SUB CODE: OC, GP NO REF SOV: 020 OTHER: 008

Card 3/3

L 1200[illegible]-65 Pa-4/Pb-4

ACCESSION NR: AP4046300 S/0217/64/009/005/0625/0627

AUTHOR: Komissarov, G. G.; Nekrasov, L. I.; Kobozev, N. I.

TITLE: The position of the red absorption maximum in green leaves and in the absorbed state B

SOURCE: Biofizika, v. 9, no. 5, 1964, 625-627

TOPIC TAGS: chlorophyll, chlorophyll absorption, chlorophyll absorption spectra, chlorophyll spectrum red maximum, chlorophyll molecule association, chlorophyll in vivo

ABSTRACT: The probable cause of the red shift of the red maximum of the chlorophyll absorption spectrum in green leaves, as compared with its position in alcohol solutions, was investigated. This shift toward longer wavelengths is explained either by the formation of an absorption complex of protein and pigment or by the interaction of densely packed chlorophyll molecules. The authors attempted to study the effect of either factor on model systems. The effect of dense packing was excluded by absorbing chlorophyll on aluminum gel from dilute alcohol solutions, which produced adsorbates with a degree of

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ACCESSION NR: AP4046300

surface filling less than unity ($\alpha < 1$). In this case, the distances between the adsorbed pigment molecules exceeded the effective cross section. Such adsorption complexes have the same position of the red maximum as the alcohol solution. The same is true of the red maximum of the diffuse reflection spectra on capron, also obtained from dilute solutions. Capron was selected because its structure is analogous to that of proteins. These facts indicate that the red shift of the red maximum in vivo cannot be explained only by the complex formation between chlorophyll and protein. The effect of densely packed molecules was studied by means of a model system in which capron was used as the adsorbent of chlorophyll from alcohol solutions. Adsorbates of various surface concentrations were obtained with α varying from 0.23 to 1.97. However, practically no red shift of the red maximum was observed in the diffuse reflection spectra. The following explanation is given for this fact: It is natural to assume that the adsorption of chlorophyll in chloroplast is different from that on, for example, capron, for in the case of a chloroplast the phytol ends of the chlorophyll molecule are situated in the lipid layer, which may permit the porphine parts of the pigment molecules to interact. The absence of the red shift in the model experiment can be explained by the

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L 12004-65
ACCESSION NR: AP4046300

weakening effect of the phytol groups which prevent dense packing and close contact of pigment molecules. Still, a shift from 665 to 672 mμ was observed in the diffuse reflection spectra of chlorophyll adsorbates placed on poly(methyl methacrylate) by evaporation of alcohol solution whose concentrations were 30 times higher than that producing the 665 mμ maximum characteristic of weaker alcohol solutions. In this case, the surface concentration of chlorophyll molecules can be very high locally, and interaction of the porphine groups of pigment molecules is very probable. Therefore, the preferred explanation of the red shift of the chlorophyll red maximum in vivo should be that of molecular interaction. This study was completed in the Chemistry Department of the Moscow State University. Orig. art. has: 2 figures.

ASSOCIATION: Khimicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova (Moscow State University, Chemistry Faculty)

SUBMITTED: 18Apr63 ENCL: 00 SUB CODE: LS

NO REF SOV: 008 OTHER: 004 ATD PRESS: 3122

Card 3/

EWG(j)/EWT(m)/EPF(c)/EPR/EWP(j)/EWP(q)/EWP(b) Pc-4/Pr-4/Ps-4

L 6666-65 EWG(j)/EWT(m)/EPF(c)/EPR/EWP(j)/EWP(q)/EWP(b) JD/WW/JFW/RM

RPL/BSD/AEDC(b)/SSD/AFWL/ESD(gs)/ESD(t) S/0076/64/038/007/1750/1756

ACCESSION NR: AP4042596

68

67

AUTHOR: Yagodovskaya, T. V. (Moscow); Nekrasov, L. I. (Moscow)

TITLE: The higher peroxide of hydrogen and frozen radicals. VIII. Infrared spectrum of peroxide-radical condensates which are formed from the dissociated vapors of water and hydrogen peroxide. 1

SOURCE: Zhurnal fizicheskoy khimii, v. 38, no. 7, 1964, 1750-1756

TOPIC TAGS: hydrogen peroxide, free radicals, infrared spectroscopy

ABSTRACT: Despite numerous data which indicate the existence of a higher peroxide of hydrogen (H_2O_4), for final verification of this fact additional independent methods are still required. This article presents the results of infrared spectral studies of peroxide-radical condensates. In the investigation the dissociation products of water and hydrogen peroxide were directed at a rock salt plate, mounted in a copper block and cooled by liquid nitrogen (-190C). The temperature was measured with a copper-constantan thermocouple. This block was mounted in the center of the vacuum cell with rock salt windows. The cell was placed in front of the input slit of a single beam spectrometer IKS-11, modified in such a way that

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L 6666-65

ACCESSION NR: AP4042556

the spectrum in 650 - 3500 cm^{-1} was recorded automatically on a potentiometric recorder EPP-0.9. Prior to each experiment, calibration of the instrument was checked by CO_2 and H_2O vapor bands. The accuracy of the determination of the position of spectra bands was ± 3 cm^{-1}. In this work 82 % H_2O_2 and doubly distilled water were used. The infrared spectrum of condensates, synthesized from dissociated water vapor and hydrogen peroxide vapor differs from the spectra of initial materials (see fig. 1 of the enclosure). The comparison of the obtained data with infrared spectra of H_2O_4, D_2O_2 and normal paraffins permits the conclusion that absorption bands at 905, 920, 927, 936, 962, 1115, 1128, 1150, 2362 cm^{-1}, which do not belong to either ice or to hydrogen peroxide, are associated with the formation of H_2O_4 in the peroxide-radical condensate. Orig. art. has: 1 table and 3 figures.

ASSOCIATION: Moskovskiy gosudarstvenny universitet im. M. V. Lomonosova (Moscow State University)

SUBMITTED: [illegible] DATE ACQ: [illegible] ENCL: 01

SUB CODE: IC NO REF SOV: 007 OTHER: 023

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ACCESSION NR: AP4042596

ENCLOSURE: 01

Fig. 1. Infrared absorption spectrum at -190 C.
1 - 100% transmission, 2- absorption of ice, 3 - absorption of hydrogen peroxide,
4 - absorption of peroxide-radical condensate, 5 - 0 % transmission

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