KRUGLOV, N.A.; SINITSYN, L.N.

Effect of aminazine and mepazine on cerebellar and medullary inhibiting processes. Farm. i toks. 22 no.2:99-104 Mr-Ap '59. (MIRA 12:6)

1. Laboratoriya chastnoy farmakologii (zav. - deystvitel'nyy chlen AMN SSSR prof. V.V.Zakusov) Instituta farmakologii i khimioterapii AMN SSSR).

(CEREBELLUM, physiol.
inhib. processes, eff. of chlorpromazine & pacatal (Rus))
(MEDULLAR OBLONGATA, physiol.
same)
(CHLORPROMAZINE, effects,
on cerebellum & medulla oblongata inhib. processes (Rus))
(AUTONOMIC DRUGS, effects,
pacatal, on cerebellum & medulla oblongata inhib. processes (Rus))

KRUGLOV, N.A.

Effect of some analgesic and narcotic substances on reciprocal inhibition. Farm.i toks. 22 no.6:488-493 N-D '59. (MIRA 13:5)

1. Laboratoriya chastnoy farmakologii (zav. - deystvitel'nyy chlen AMN SSSR prof. V.V. Zakusov) Instituta farmakologii i khimioterapii AMN SSSR.
(ANALGESICS)
(NARCOTICS pharmacol.)
(INHIBITION)

KRUGLOV, N. A.

"The Effect of Analgesics of the Morphine Group on the Process of Sensual Inhibition"

Second International Pharmacological Congress, Prague, Czechoslovakia 20-23 August 1963

Institute of Pharmacology and Chemotherapy, Moscow.

KRUGLOV, N.A.

Effect of the porphine group analgesics on central inhibitory processes. Uch.zap.Inst. farm. i khimioter. AMN SSSR. 3: 65-75'63. (MIRA 16:9)

1. Department of Pharmacology (Head - Prof. V.V.Zakusov, Member of the U.S.S.R. Academy of Medical Sciences) of the Institute of Pharmacology and Chemotherapy.
(ANALGESICS) (INHIBITION)

USSR/Communications - Radio May 1947
Modulation

"Plate [illegible]odulation," N G Kruglov, 2 pp

"Vestnik [illegible] Vol 7, No 84

General discussion of the plate modulation system. Used and approved in radio station at Riga. Desirability of system for economic reasons is stressed.

1T16

KRUGLOV, N. G.

Mar/Apr 49

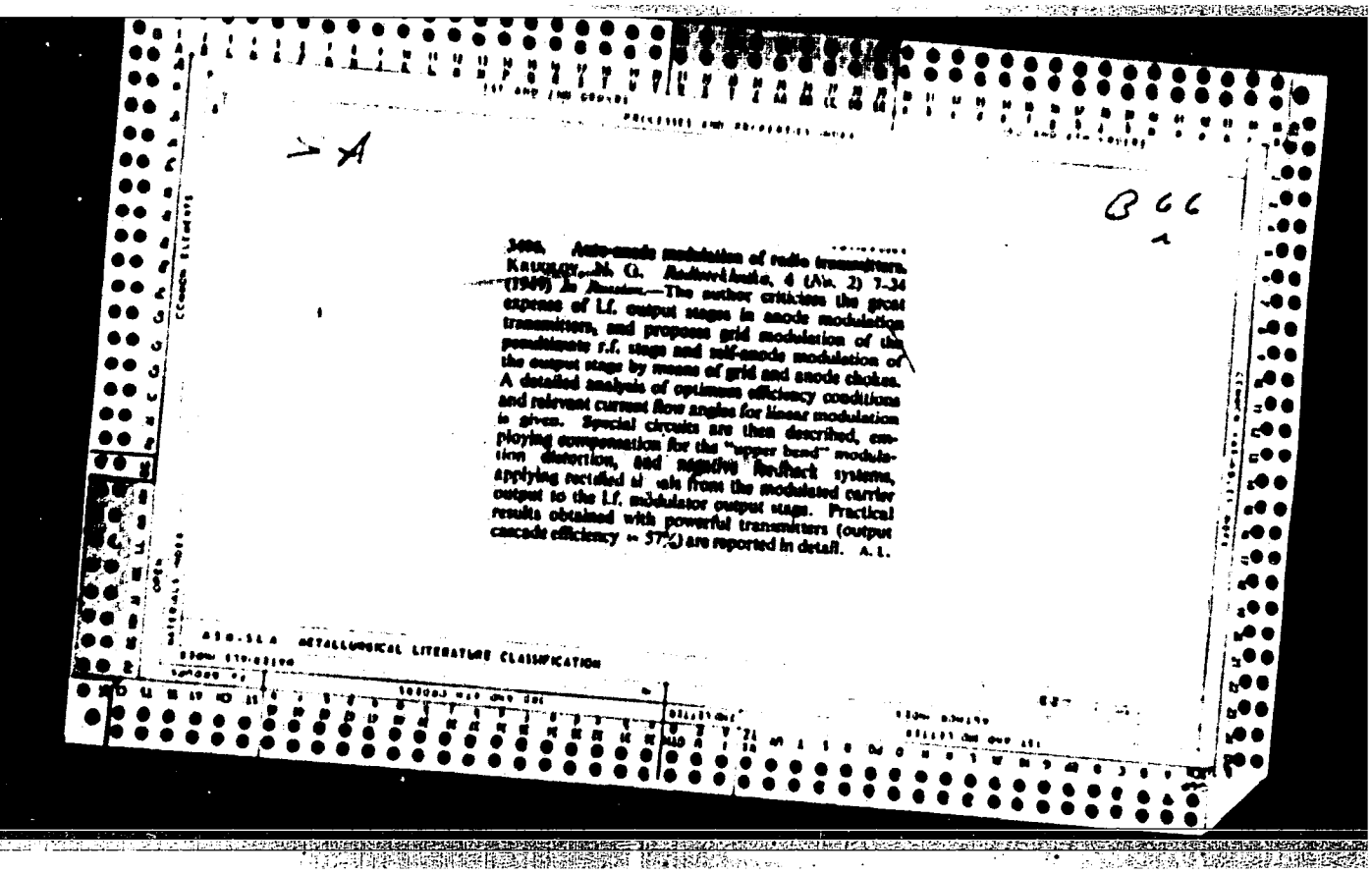
USSR/Radio
Modulation, Plate
Transmitters

"Automatic Plate Modulation of Radio Broadcasting Transmitters," N. G. Kruglov, Engr, 18 pp

"Radiotekh" No 2

Describes new method called autoplate modulation which doubles the efficiency with normal modulation and doubles the power of the tubes compared to Class B plate modulation. It is based on the principle that tubes in cascade not only amplify high-frequencies but also function as plate modulators. Includes 14 diagrams and graphs.

50/49T104



3466. Auto-anode modulation of radio transmitters. Kaganov, Sh. G. *Radiotekhnika*, 4 (No. 2) 7–34 (1949) In Russian.—The author criticizes the great expense of L.f. output stages in anode modulation transmitters, and proposes grid modulation of the penultimate r.f. stage and self-anode modulation of the output stage by means of grid and anode chokes. A detailed analysis of optimum efficiency conditions and relevant current flow angles for linear modulation is given. Special circuits are then described, employing compensation for the "upper bend" modulation distortion, and negative feedback systems, applying rectified signals from the modulated carrier output to the L.f. modulator output stage. Practical results obtained with powerful transmitters (output cascade efficiency = 57%) are reported in detail. A. L.

KRUGLOV, N. G. (Engr)

KRUGLOV, N. G. (Engr) -- "Self-Anode Modulation of Radio Transmitters," Sub 23 Dec 52, Moscow Electrical Engineering Inst of Communications. (Dissertation for the Degree of Candidate in Technical Sciences).

SO: Vechernaya Moskva, January-December 1952

KRUGLOV, N.

"Automatic plate modulation in low-powered transmitters."

So. Radio, Vol. 8, p. 45, 1952

KRUGLOV, N.

Radio - Transmitters and Transmission

Auto-anodic modulation in low-powered transmitters., Radio, No. 8, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1952 1953, Uncl.

KRUGLOV, N.

"Automatic plate modulation in low-powered transmitters."

So. Radio, Vol. 9, p. 32, 1952

KRUGLOV, N. G.

"Question of Plate Modulation," Radio Tekh., July, 1954

USSR/Electronics - Self-anode modulation of transmitters FD-1053

Card Pub 90-1/12

Author : N. G. Kruglov

Title : Some problems of self-anode modulation

Periodical : Radiotekhnika 9, 3-21, Jul/Aug 1954

Abstract : Author discusses the equivalent circuit and certain problems of the theory of self-anode modulation; indicates the most essential characteristics of the operation of basic self-anode modulation circuits (i.e., with automatic bias variation and controllable bias); and briefly examines the problem of the inertia of self-anode modulation. Four references; USSR, 1946-1952. Schematic diagrams; graphs.

Institution : --

Submitted : 3 March 1951

KHUGLOV, N.M.

Carry out ship repairs in a satisfactory manner. Rech.transp. 18 no.12:21-22 D '59. (MIRA 13:4)

1. Nachal'nik slushby sudovogo khozyaystva Volzhskogo ob"yedinennogo rechnogo parokhodstva.
(Ships--Maintenance and repair)

KHUDYKH, Mikhail Il'ich; KRUGLOV, N.P., retsenzent; MANSUROV, V.N., retsenzent; KOPELEVICH, Ye.I., redaktor; MEDVEDEV, L.Ya., tekhnicheskiy redaktor

[Repair and installation of equipment in textile enterprises and light industries; the general part] Remont i montazh oborudovaniia predpriiatii tekstil'noi i legkoi promyshlennosti; obshchaia chast'. Moskva, Gos. nauchno-tekhn. izd-vo Ministerstva legkoi promyshl. SSSR, 1956. 310 p. (MLRA 9:9)
(Machinery)

KRUGLOV, N. I., Cand Med Sci -- (diss) "Condition of the communal public welfare in the city of Vitebsk, the dynamics of acute intestinal diseases, and means to further improvement of the sanitary conditions of the city." Leningrad, 1960. 25 pp; (Leningrad State Order of Lenin Inst of Advanced Training of Physicians im S. M. Kirov); number of copies not given; price not given; (KL, 21-60, 130)

SOV/96-59-8-22/2?

AUTHOR: Kruglov, N.V., Candidate of Technical Sciences

TITLE: Vibration Standards for Turbo Machines

PERIODICAL: Teploenergetika 1959, Nr 8, pp 85-87 (USSR)

ABSTRACT: Standards of permissible vibration have been drawn up for steam turbines and turbo blowers and considerable experience of this subject is available. However, vibration in high-speed gas turbines is not fully understood. Experimental investigations are difficult; for instance, strain gauges cannot easily be applied to high-speed blading. Vibration measurements can be made on external surfaces of the frame but in the main this gives information only about main shaft vibration and does not disclose the sources of high-frequency vibration. On the basis of experience with machines running at 3000 to 5000 rpm numerous standards have been drawn up for permissible vibration. They usually define permissible amplitudes of vibration on the main bearings. Many factors that influence vibration in machines such as clearances, lubrication, wear of bearings, output, foundation arrangements and others are not taken into

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account. Vibration cannot be limited simply by restricting the amount of rotor unbalance, for unbalance is not the only cause of vibration. It will be seen that existing vibration standards are empirical and of somewhat limited validity, even for machines running at 3000 to 5000 rpm, and the most that can be said about machines running at 25000 rpm is that the amplitude of vibration should not exceed a few microns. However, since nothing better is available the best use possible must be made of existing standards for medium-speed machines when evaluating permissible vibration in high-speed machines. The existing standards have accordingly been analysed and the results expressed as graphs of vibration against speed. In curve (a), amplitude of vibration is plotted against speed in log/log coordinates; in curve (b) permissible values of amplitude are related to speed in linear coordinates. Existing standards are so written that the graphs are straight lines on log/log paper, but the slope differs between standards. There is another method of assessing the intensity

 of vibration besides the amplitude, namely the magnitude of

Vibration Standards for Turbo Machines

the maximum acceleration, or the dimensionless ratio of this acceleration to gravity. Existing standards all permit some increase in this ratio over the speed range 1500 to 5000 rpm. On the basis of the analysis, one way of defining permissible vibration is to assume a constant value for the product of amplitude and speed. If the existing standard values are extended to machines running at higher speeds with the additional limitation that at 30000 rpm the acceleration should not exceed 2g, then the formula for limiting amplitude of vibration becomes:

$$\frac{A\pi^2 n^2}{900\ g} = 2$$

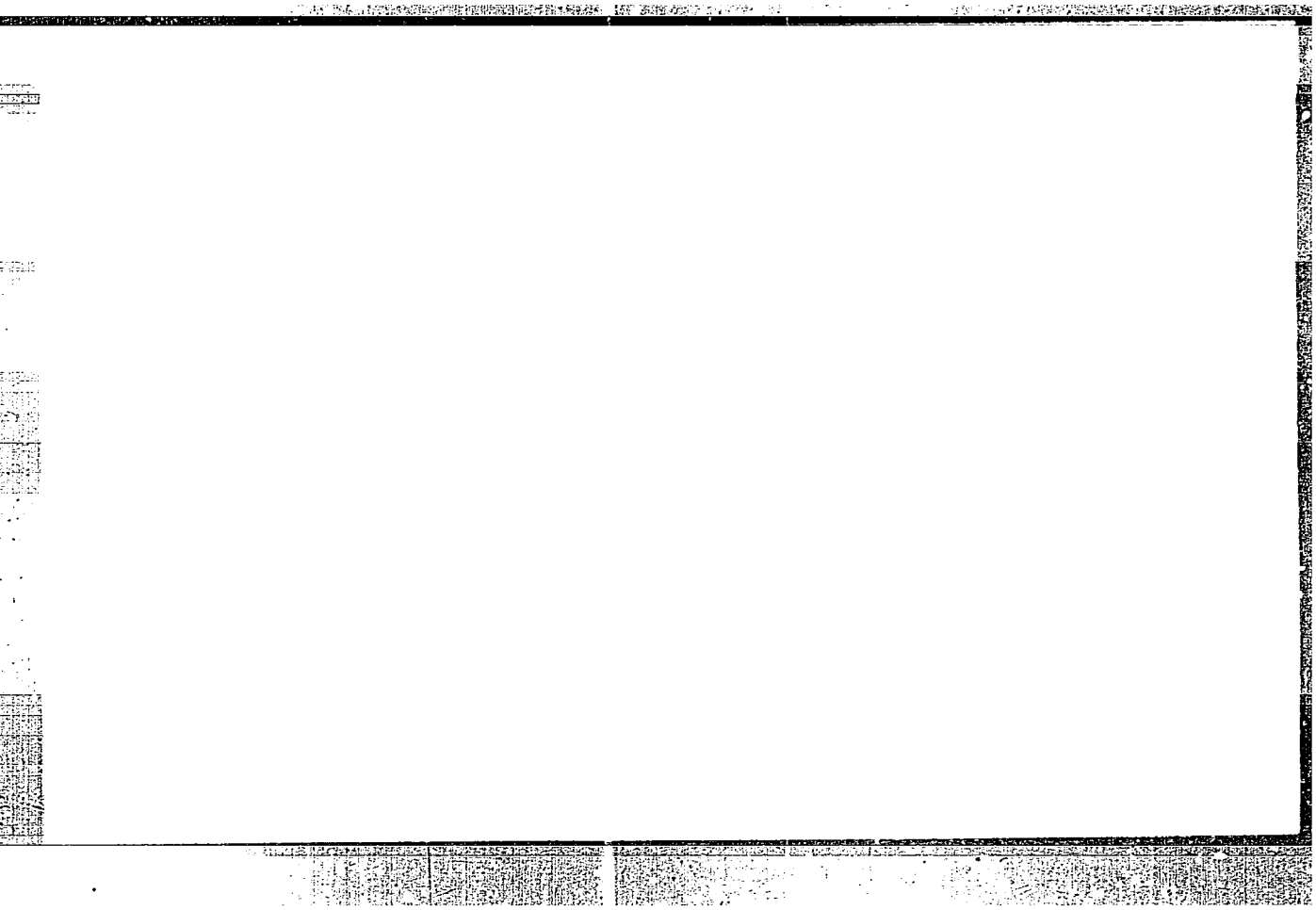
This formula gives a permissible amplitude of 2 microns at 30000 rpm and 20 x 10^{-3} mm at 3000 rpm, this latter value corresponding to the usual standards including GOST 5908-51. The proposed formula also gives acceptable values for machines of intermediate speed. In some cases it may be

Card 3/4 permissible to use a higher acceleration than 2g, but in

Vibration Standards for Turbo Machines

no case should the amplitude be greater than the recommended maximum value on the graph. It will probably be found that the recommended standard is conservative, but it should only be relaxed when considerably more experience has been gained. There are 2 figures and 3 Soviet references.

Card 4/4



APPROVED FOR RELEASE: 06/19/2000 CIA-RDP86-00513R000826720001-5"

Kruglov, O.V.

ZAKUTSKIY, Ivan Petrovich; KRUGLOV, Oleg Vladimirovich; KLEYMENOV, F.I., otvetstvennyy red.; SABITOV, A., tekhn.red.

[Underground gasification of coal in the Donets Basin] Podzemnaia gazifikatsiia kamennykh uglei v Donbasse. Moskva, Ugletekhizdat, 1957. 26 p. (MIRA 11:4)
(Donets Basin--Coal gasification, Underground)

KRUGLOV, O.V.

Calculation and alignment of oriented boreholes for underground coal gasification. Podsem.gaz.ugl. no.1:39-45 '57. (MLRA 10:7)

1. Lisichanskaya stantsiya "Podzemgaz."
(Mine surveying) (Coal gasification, Underground)

KRUGLOV, O.V.

Summary of operations at the Lisichansk "Podsemgaz" plant during 1954-1956. Podsem.gaz.ugl. no.2:31-38 '57. (MLRA 10:7)

1. Lisichanskaya stantsiya "Podsemgaz."
(Donets Basin--Coal gasification, Underground)
(Lisichansk--Gas producers)

KRUG'LOV, O.V.; YUDBOROVSKIY, I.M.

Some remarks on V.I. Pronin's and D.A. Sokolov's article "Methods of boring inclined directional boreholes." Podzem.gaz.ugl. no.1:70-72 '58. (MIRA 11:4)

1. Sinichanskaya stantsiya "Podzemgaz." kontora opytnogo napravlennogo bureniya.
(Boring machinery)

ZHIRNYY, A.Ye.; KRUGLOV, O.V.; POLOSIN, I.A.

Connecting and putting into operation boreholes for underground gasification. Podzem.gaz.ugl. no.2:43-44 '59. (MIRA 12:9)

1. Lisichanskaya stantsiya "Podzemgaz", sektor No.15 Vsesoyuznogo nauchno-issledovatel'skogo i proyektnogo instituta podzemnoy gazifikatsii ugley.
(Coal gasification, Underground) (Boring)

KRUGLOV, O.V.; YUDBOROVSKIY, I.M.

Deviation of the gallery in drilling directional boreholes.
Podzem.gaz.ugl. no.3:43-49 '59. (MIRA 12:12)

1. Lisichanskaya stantsiya "Podzemgaz."
(Boring) (Coal gasification, Underground)

KRUGLOV, O.V.; YUDBOROVSKIY, I.M.

Calculation of the inscribed action radius of Mine face motors and boring equipment in directed hole boring. Podzem.gaz.ugl. no.4:42-46 '59. (MIRA 13:4)

1. Lisichanskaya stantsiya "Podzemgaz."
(Boring) (Lisichansk--Coal gasification, Underground)

YUDIN, I.D., kand. khim. nauk; KRUGLOV, O.V. [deceased]; MAKEROVA, M.I.; MIRYUKOV, V.F.

Certain dependence of the heat of combustion of gas on the rate of the flow in the gasification channel. Trudy VNIIPodzemgaza no.12:19-27 '64. (MIRA 18:9)

Kruglov, P.

KRUGLOV, P.

Zarladka bortovykh kislorodnykh ballonov. (Vestnik vozdushnogo flota, 1937 v. 19, no. 8, p. 50-52, illus,)

Title tr.: Charging of oxygen cylinders for use on board aircraft.

TL504.V45 1937

SO: Aeronautical Sciences and Aviation in the Soviet Union, Library of Congress, 1955

ACC NR: AT7004446 (N) SOURCE CODE: UR/2531/66/000/199/0107/0113

AUTHOR: Kruglov, R. A.

TITLE: Measurement attachment for a ground-based pulsed-light cloud-height indicator

ORG: none

SOURCE: Leningrad. Glavnaya geofizicheskaya observatoriya. Trudy, no. 199, 1966. Meteorologicheskiye pribory i avtomatizatsiya meteorologicheskikh izmereniy (Meteorological instruments and the automation of meteorological measurements), 107-113

TOPIC TAGS: meteorology, meteorologic instrument, cloud cover, cloud level, weather station, automatic telemetering weather station, pulsed-light cloud-height indicator

PURPOSE AND COVERAGE: The author reviews the various advantages of the pulsed-light cloud-height indicator over instruments using the triangulation technique in measuring the heights of cloud bases. He considers that the former shows the greatest promise for use in automatic-telemetering weather stations. However, he points out that, at present,

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ACC NR: AT7004446

this instrument has three significant shortcomings: 1) the pulse tubes are good for only 1000 separate measurements; 2) remote operation does not exceed 100 m; and 3) the instrument must be operated manually. The Main Geophysical Observatory has developed an attachment for lot-produced pulsed-light cloud-height indicator, thus eliminating the cited disadvantages and making this indicator adaptable to automatic-telemetering weather stations with remote operation up to 5--7 km. A block diagram of the indicator and attachment is given in Fig. 1. The article also contains a circuit diagram of the attachment. It is stated that the instrument error does not exceed 7% of scale. For lower and upper measurement limits of 50 and 1000 m, the sensor d.c. output voltage is 60 and 3, respectively. The operating principle of the attachment and indicator is explained in some detail. The attachment, which measures 210 x 270 x 190 mm, is connected to the cloud-height indicator by a short 12-strand cable and to the automatic-instrumentation unit or control console by a 5-strand cable 2 to 7 km long. In 1963, laboratory tests were conducted with a prototype system in which a 5-km-long communication line was simulated. For comparison purposes, cloud-height measurements were made with and without the attachment. The results showed no appreciable differences between the indicator readings and the measurement-attachment readings. A table of the test results of 21 measurements shows that in 11 cases the readings were identical, in 5 cases they differed by only 10 m, and in 5 cases, by 20 m. Orig. art. has: 2 figures and 1 table.

Card 2/4

ACC NR: AT7004446

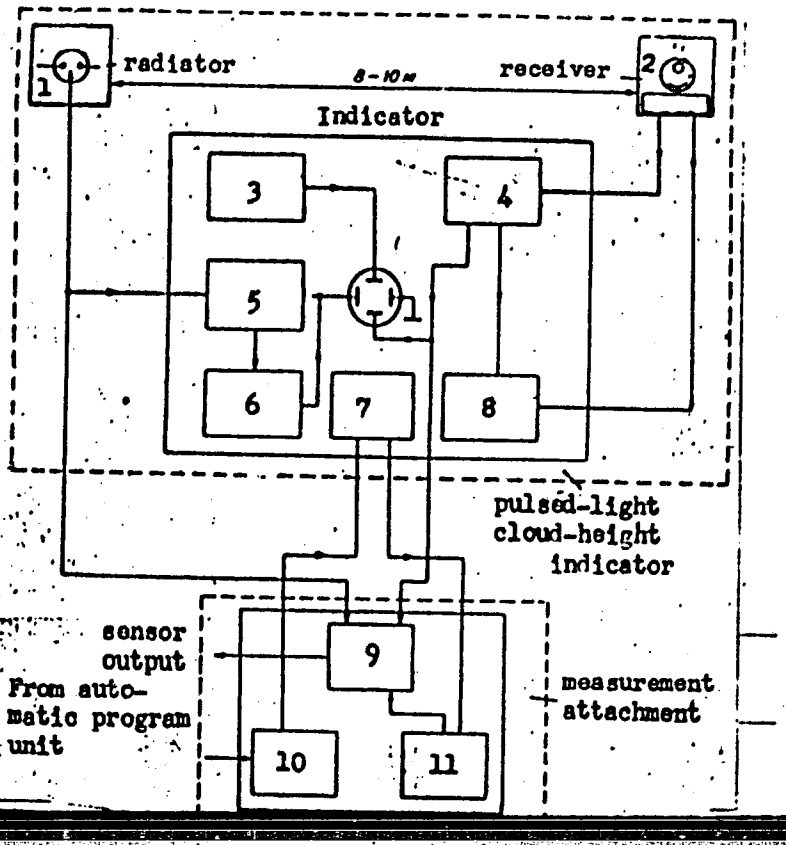

Fig. 1. Block diagram of pulsed-light cloud-height indicator and measurement attachment.
1-pulse tube; 2-FEU-1 photo-multiplier and preamp; 3-rectifier; 4-video amplifier; 5-sweep generator; 6-time-mark generator; 7-power source; 8-AGC and limiter; 9-measuring unit; 10-relay unit; and 11-power source

Card 3/4

ACC NR: AT7004446

[W.A. N-67-4]
[LB]

SUB CODE: 04, 09/ SUBM DATE: ~~00~~ none ORIG REF: 005/

Card 4/4

Kruglov, R. N.

USSR/Physical Chemistry - Solutions. Theory of Acids and Bases, B-11

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 489

Author: Vinnik, M. I., Kruglov, R. N., and Chirkov, N. M.

Institution: None

Title: Acidity of Aqueous Solutions of Hydrobromic and Hydrochloric Acid

Original Periodical: Zh. fiz. khimii, 1956, Vol 30, No 4, 827-836

Abstract: The indicator method was used in measuring the acidity H_0 of aqueous solutions of HBr(I) and HCl(II) over the concentration ranges 0.275-56.52 wt percent and 8.9-40.47 wt percent, respectively. From the experimental values of H_0, values were calculated for $(f_{H_3O} + f_B)f_{BH} +$ (III) and $f_B/(f_A - f_{BH}$ (IV). The standard state is chosen such that the acid ionization constant $[HA]/K_A = 1$. It is shown that the ratio III increases with increasing concentrations of I and II and the ratio IV is practically independent of the concentrations of I and II and is equal to one. For aqueous solutions of I and II up to 16-17 ml, the acidity H_0 is numerically equal to $\log(a_{HA}/c_A)$, where a_{HA} is the

Card 1/2

USSR/Physical Chemistry - Solutions. Theory of Acids and Bases, B-11

Abst Journal: Referat Zhur - Khimiya, No 1, 1957, 489

Abstract: activity of the acid determined from the emf or from the vapor pressure and c_{A^-} is the concentration of the halide ion.

1. AKAD. NAUK SSSR, Inst. KHIMICHESKOY Fiziki, MOSKVA.

Card 2/2

VINNIK, M.I.; KRUGLOV, R.N.; CHIRKOV, N.M.

Acidity functions of boron fluoride in phosphoric acid solutions.
Zhur.fiz.khim. 31 no.4:832-835 Ap '57. (MLRA 10:7)

1. Akademiya nauk SSSR, Institut fizicheskoy khimii.
(Boron fluoride) (Phosphoric acid)

KRUGLOV, S.

28131

Bystro i bez poter' ubrat' urozhay, dosrochno vypolnit' plan khlebozagotovok, (Zadachi partorganizatsiy). Bolshevik Kazakhstana, 1949-I.S. 6-16.

KRUGLOV, S. Promptly, (fast), without any losses, reap the harvest, thus sufficient to complete the plan of grains (bread) storing.(bread preserving). (The problem of party's organization). Bolshevik, Kazakhstana, 1949, No.9, page 6-16.

SO. LETOPIS NO. 34

KRUGLOV, S. A.

Kruglov, S. A.

"Investigation of the convective heat exchange between a granulated material and a gas flow." Min Higher Education USSR. Moscow Order of Labor Red Banner Petroleum Inst imeni Academician I. M. Gubkin. Moscow, 1956 (Dissertation for the degree of Candidate in Technical Sciences)

Knizhnaya letopis'
No. 35, 1956. Moscow

KRUGLOV, S.A.

KRUGLOV, S.A., Cand Tech Sci -- (diss) "Study of convective heat exchange between granular material and gas flow." Mos 1958. 13 pp (Min of Higher Educ USSR. Mos Order of Labor Red Banner Petroleum Inst im Acad I.M. Gubkin). 110 copies (KL, 20-58,97)

KRUGLOV, S.A.; SKOBLO, A.I.

Investigating convective heat transfer between a granular material and a gas stream. Khim i tekh. topl. i masel 3 no.3:23-30 Mr '58. (MIRA 11:3)

1.Moskovskiy neftyanoy institut im akademika I.M. Gubkina.
(Heat--Transmission)
(Fluidization)

KRUGLOV, S.A.

Heating apparatus with a granulated heat-carrying agent; some problems of design and utilization. Trudy MNI no.23:101-115 '58. (MIRA 12:1)

(Heat engineering) (Petroleum--Refining)

VIKHMAN, Georgiy L'vovich; KRUGLOV, Sergey Aleksandrovich; BASKAKOV, A.A., inzh., retsenzent; YEFREMOVA, T.D., ved. red.; VOROB'YEVA, L.V., tekhn. red.

[Principles of the design of equipment and machines for petroleum refineries] Osnovy konstruirovaniia apparatov i mashin neftepererabatyvaiushchikh zavodov. Moskva, Gos. nauchno-tekhn. izd-vo neft. i gorno-toplivnoi lit-ry, 1962. 110 p. (MIRA 15:2)
(Petroleum refineries--Equipment and supplies)

PAVEL, A.; SKOBLO, A.I.; KNUGLOV, S.A.

Heat exchange in a fluidized bed between a gas flow and the particles of a solid heat carrier. Izv. vys. ucheb. zav.; neft' i gaz 8 no.1:59-62 '65.

(MIRA 18:2)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti imeni akademika I.M. Gubkina.

MATVEYEV, Mikhail Aleksandrovich; SMIRNOVA, Klavdiya Aleksandrovna; SIL'VESTROVICH, S.I., nauchnyy redaktor; KRUGLOV, S.A., redaktor; LYUDKOVSKAYA, N.I., tekhnicheskiy redaktor

[Porous silicate products] Poristye silikatnye izdeliia. Moskva, Gos. izd-vo lit-ry po stroit. materialam, 1956. 106 p. (MLRA 9:10)
(Building materials) (Silicates)

WHITAKER, T.; SOLOV'YEV, S.N. [translator]; SOROKER, V.I., doktor tekhnicheskikh nauk, redaktor; KRUGLOV, S.A., redaktor; GLADKIKH, N.N., tekhredaktor

[Lightweight concrete in the United States. Translated from the English] Legkie betony v SShA. Perevod s angliiskogo S.N.Solov'eva, pod red. V.I.Sorokera. Moskva, Gos. izd-vo lit-ry po stroit. materialam, 1956. 147 p. (MLRA 10:3)
(United States--Lightweight concrete)

KAPLANSKIY, Yakov Lazarevich; IL'INICH, I.M., nauchnyy red.; KRUGLOV, S.A., red.; GILENSON, P.G., tekhn.red.

[Building yards with combines for concrete work] Poligon s betoniruyushchim kombainom. Moskva, Gos.izd-vo lit-ry po stroit.materialam, 1957. 107 p. (MIRA 11:2)
(Precast concrete)

[illegible], S.I.

POLOMEYEV, Aleksandr Alekseyevich; SUSHIKOV, A.A., nauchnyy redaktor; KRUGLOV, S.A., redaktor; PYATAKOVA, M.P., tekhnicheskiy redaktor

[Equipment for prestressing] Oborudovanie dlia napriazhennogo armirovaniia. Moskva, Gos. izd-vo lit-ry po stroit. materialam, 1957. 198 p. (MLRA 10:10)
(Prestressed concrete)

KRUGLOV S.N

KRIVITSKIY, Mikhail Yakovlevich, kand.tekhn.nauk; VOLOSOV, Naum Semenovich, inzh.; NEKRASOV, K.D., doktor tekhn.nauk, nauchnyy red.; KRUGLOV, S.A., red.; GILENSON, P.G., tekhn.red.

[Plant manufacture of elements from foam cement and foam silicate] Zavodskoe izgotovlenie izdelii iz penobetona i penosilikata. Moskva, Gos. izd-vo lit-ry po stroit., arkhit. i stroit. materialam, 1958. 158 p.

(Precast concrete) (MIRA 11:5)

KRUGLOV, S., inzh.

Designs of asbestos-cement wall panels. Stroi. mat. 4 no.11:9-14 N '58. (MIRA 11:12)

(Asbestos Cement) (Walls)

KRUGLOV, S., inzh.; SOKOLOVSKIY, N., inzh.

Factory-made asbestos cement construction elements and products.
Zhil. stroi. no.5:17-20 '59. (MIRA 12:8)
(Asbestos cement)

KRUGLOV, S. I.

PA 233T82

USSR/Metallurgy - Cast Iron, Technology Sep 52

"Production of High-Strength Cast Iron in Small Foundries," M. M. Vyshemirskiy, S. I. Kruglov, Engineers

"Litey Proizvod" No 9, pp 27-29

Cites difficulties experienced by small foundry shops due to necessity of having devices for making Mg alloys and for introducing these alloys into ladle. Attempting to develop simple and inexpensive technological process, suggests Mg-ferrosilicon with 20-25% Mg and 55-60% Si as alloy most suitable for modification of metal in ladle in process of obtaining high-strength cast irons. Application of alloy eliminates double inoculation with Cu-Mg and ferrosilicon which occurs in usual process.

233T82

DEMIN, V.N.; KRUGLOV, S.L.

Some problems of reference and information work in foreign countries.
NTI no.11:42-43 '63.
(MIRA 17:2)

KOLCHINSKIY, M.L.; KRUGLOV, S.L.

Science and technology documentation in an information system.
NTI no.4.9-18 '65.
(MIRA 18:6)

DEMIN, V.N.; KRUGLOV, S.L.

Some problems in reference and information work in foreign countries. Pt. 2. NTI no.12:51-54 '63. (MIRA 17:6)

KRUG-tet, S. P.

AUTHOR: Kruglov, S. P.,

TITLE: A Comparison of the γ-Energy of a Synchrotron measured Calorimetrically and by Ionization (Sravneniye kalorimetricheskikh i ionizationnykh izmereniy potoka energii γ-luchey ot sinkhrotrona)(Letter to the Editor)

56-4-43/54

PERIODICAL: Zhurnal Eksperim. i Teoret Fiziki, 1957, Vol. 33, Nr 4, pp. 1060-1062, (USSR)

ABSTRACT: The measurements were carried out on a synchrotron LFTI at 85 MeV. By both methods the energy of the γ-rays is measured which is necessary to produce 1 Coulomb charge in a special chamber. When the calorimetric measurement is employed, the γ-energy is absorbed in lead cylinders (R = 5,5, L_1 = 11cm, L_2 = 4cm) of different length. The temperature rise of the lead is calorimetrically measured. The results for the two cylinders differ by 2%. When the second method is employed, the dependence of the ionization in a thin-walled chamber on the thickness of the absorbers which are placed before the chamber is measured. C, Al, Cu and Pb are used as absorbers. The data obtained by means of this method are except the Pb-measurement in agreement with those obtained by the first method within the limit of error. The second method was also applied to a thick-walled chamber. The measurement results of all 3 series of measurement agree within the domain of maximum errors. There are 3 tables.

Card 1/2

A Comparison of the γ-Energy of a Synchrotron Measured Calorimetrically and by Ionization 56-4-43/54

ASSOCIATION: Leningrad Physico-Technical Institute AN USSR (Leningradskiy fiziko-tekhnicheskiy institut Akademii nauk SSSR)

SUBMITTED: July 11, 1957

AVAILABLE: Library of Congress

Card 2/2

24(3)(7)
AUTHOR: Kruglov, S.P.

SOV/57-28-10-33/40

TITLE: Calorimetric Measurement of the Energy Flux of γ- Radiation From a Synchrotron (Kalorimetricheskoye izmereniye potoka energii γ-luchey ot sinkhrotrona)

PERIODICAL: Zhurnal tekhnicheskoy fiziki, Vol 28, Nr 10, pp 2310-2323 (USSR) 1958

ABSTRACT: This paper starts with a description of the principal features and of the principles of operation of the calorimeter used in this work. The experiments were to disclose information bearing on a comparison of the various methods in use for the measurement of the energy flux of the γ-bremsstrahlung (Ref 6). The design of the calorimeter is described. It is applicable to measurements of the energy flux of γ-radiation with a limit energy of the spectrum of 500 MeV. The temperature rise was measured by means of thermistors. The calibration of the calorimeter was carried out with the help of lead-canned cylindrical heating elements. It is assumed that the design of the cylinder adopted guarantees a good thermal contact of the heating element with the medium. The maximum error in the calibration did not exceed 1 %. Curves describing the calorimeter sensitivity were plotted for cylinders with a length of 11 and 4 cm. The energy flux measurements were performed at an

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Calorimetric Measurement of the Energy Flux of γ-Radiation From a Synchrotron

SOV/57-28-10-33/40

E_{max} = 45, 65, and 85 MeV. The results given in MeV per 1 Coulomb of charge (in the standardized copper chamber) are in the range of 45 to 85 MeV independent of E_{max}, a thickness of 13 mm of copper of the frontal wall of this chamber being chosen. E_{max} is the maximum energy of the spectrum. The difference of the results obtained with cylinders of different length do not vary by more than 3 %. The maximum error in the measurements of the energy U, given in MeV/Coulomb does not exceed 4 %. At present studies are under way which are intended to yield a comparison with the ionization measurements with a calorimeter by investigating the absorption of the energy of the γ-bremsstrahlung in various materials. A.P. Komar showed constant interest in the work, Z. Kovarzh and I.V. Lopatin assisted in the measurements. N.N. Chernov was head of the synchrotron crew. There are 9 figures, 4 tables, and 13 references, 1 of which is Soviet.

Card 2/3

Calorimetric Measurement of the Energy Flux of γ-Radiation From a Synchrotron

307/57-28-10-33/40

SUBMITTED: December 3, 1957

Card 3/3

S/139/59/000/06/021/034
E032/E114

24,6810

AUTHORS: Kruglov, S.P., Kovarzh, Z., and Lopatin, I.V.

TITLE: Relation between the Roentgen and the Energy of Gamma Radiation Incident per Square Centimetre

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1959, Nr 6, pp 139-144 (USSR)

ABSTRACT: It is usual at the present time to express the intensity of gamma radiation obtained from accelerators in energy units such as w/cm^2 or $MeV/cm^2.sec$. However, frequently another unit is used, namely, roentgen/min. On the other hand, it is well known that the roentgen loses its significance as a unit above 3 MeV. The present authors have used the calorimetric method to establish the connection between the roentgen and the energy in MeV/cm^2 for E_{max} = 45, 65 and 85 MeV. The gamma rays were produced by the synchrotron of the Leningrad Physico-Technical Institute of the Academy of Sciences, USSR. The experimental arrangement is shown in Fig 1, in which T is the synchrotron target, З is a lead screen, K is a collimator, M is an ionization chamber monitor, MГ is a clearing magnet, KЛ is the

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69163

S/139/59/000/06/021/034
E032/E114

Relation between the Roentgen and the Energy of Gamma Radiation Incident per Square Centimetre

calorimeter, CT is an adjustable calorimeter table, C is the standard ionization chamber (13 mm copper front wall), HK is a thimble chamber similar to the Victoreen chamber (volume = 2 cm^3), and ϑ is a lead jacket (3.1 mm thick). The distances between the various parts of the apparatus are indicated, and are in mm. The gamma ray beam diameter was determined with the aid of an X-ray film and was found to be 5.45 cm at the standard ionization chamber. The intensity of the gamma beam was found to be uniform over its cross-sectional area to within 2-3%. Recombination effects were found to be negligible. In the first stage of the experiment the calorimeter was used to determine the energy of the gamma rays necessary to produce one coulomb of charge in the standard ionisation chamber. The energy necessary to produce one coulomb of charge in the monitor was also determined. From these determinations it was found that at E_{max} = 85 MeV the required factor was 4.25 x 10^{18} MeV/coulomb in the standard chamber.

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S/139/59/000/06/021/034
E032/E114

Relation between the Roentgen and the Energy of Gamma Radiation Incident per Square Centimetre

The second stage of the measurements consisted in the determination of the charge (in coulombs) collected by the Victoreeen chamber corresponding to 1 coulomb collected by the standard chamber. This gave the value of the ratio V/S where V refers to the Victoreen chamber and S to the standard chamber. The ratio V/S = α then indicates that a charge of α coulombs collected in the Victoreen chamber is due to a gamma ray energy which produces in the standard chamber 1 coulomb of charge. Knowing the volume of the Victoreen chamber, it is thus possible to determine the number of roentgens, and knowing the area of the beam at this chamber one can determine the number of MeV/cm^2. The ratio of these quantities gives the factor MeV/cm^2.r. Experiments showed that at 85, 65 and 45 MeV this factor is 1.68×10^9, 1.65×10^9 and 1.56×10^9 MeV/cm^2.r, respectively. The maximum error is 7-8%. Fig 2 shows the results of the present work together with those of other workers. Good agreement is found for the values

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69163
S/139/59/000/06/021/034
E032/E114

Relation between the Roentgen and the Energy of Gamma Radiation Incident per Square Centimetre

at 45 MeV, which is the only point in common with the previous determinations.
This paper was reported at the Inter-Collegiate Conference on Accelerators (Tomsk, February 1958).
There are 2 figures and 6 English references.

Card 4/4

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut AN SSSR (Leningrad Physico-Technical Institute, Academy of Sciences, USSR)

SUBMITTED: December 27, 1958

KRUGLOV, S.P.; LOPATIN, I.V.

Realtionship of absorbed energy and ionization for γ-quanta of E_{max} 85 Mev. Zhur.tekh.fiz. 29 no.2:273-275 F '59. (MIRA 12:4)

1. Fiziko-tekhnicheskiy institut AN SSSR, Leningrad.
(Gamma rays)

24.6810

69427
S/139/60/000/01/001/041
E032/E314

AUTHORS: Kruglov, S.P., Kovarzh, Z. and Lopatin, I.V.

TITLE: Comparison of Ionisation and Calorimetric Measurements of the Intensity of γ-rays from a Synchrotron

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Fizika, 1960, Nr 1, pp 3 - 11 (USSR)

ABSTRACT: It has been shown (Ref 1) that there is a discrepancy of 25-30% between γ-ray energy-flux measurements by different methods. The present paper is concerned with the physical reasons for this discrepancy and describes experiments which have been carried out using the 85 MeV synchrotron of the Leningrad Physico-technical Institute of the Ac.Sc., USSR. The γ-ray flux was measured both by the calorimetric and the ionisation methods. In the calorimetric method the γ-rays were absorbed in a lead cylindrical absorber and the temperature change was measured with the aid of a thermistor. Absorbing cylinders 11 cm and 4 cm long were used. The calorimeter employed is shown in Figure 1. In this figure, 1 is a perspex container, 2 is a steel chamber, 3 are polished plates, 4 are steel pillars, 5 are stirrers, 6 is an aluminium plate, 7 are aluminium foils, 8 are brass

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Comparison of Ionisation and Calorimetric Measurements of the Intensity of γ-rays from a Synchrotron

flanges, and all the dimensions indicated are in mm. As can be seen, two identical calorimeters are employed in order to reduce the effect of fluctuations in the external temperature. The thermistors in the two cylinders had equal temperature coefficients (to better than 0.5%) and were included in opposite arms of a Wheatstone bridge. The cylinders were well insulated from the chamber 2 and from each other. To achieve this they were suspended on thin threads in a vacuum of 10^{-4} mm Hg. The surface of the cylinders and of the reflectors 3 was carefully polished to reduce radiation losses. The envelope 1 was thermostated. The instrument was calibrated with the aid of a special heating element which communicated/an accurately known amount of energy to the cylinders. The calibration curve for a cylinder 11 cm long is shown in Figure 3. The accuracy is indicated by the dotted lines and is ± 1%. A photograph of the calorimeter is shown in Figure 2. Figure 4 shows the disposition of the apparatus in an actual

Comparison of Ionisation and Calorimetric Measurements of the Intensity of γ-rays from a Synchrotron

experiment. The γ-ray beam which leaves the collimator K passes through the monitor M , a clearing magnet MГ and enters the cylinder Ц of the calorimeter КЛ. A standard ionisation chamber C is placed behind the calorimeter in the path of the beam. The charge collected in this chamber per unit energy of the γ-beam depends only on the maximum energy E_{max} at a given temperature and pressure. The measurements were carried out in two stages; First, the energy of the γ-beam necessary to produce one coulomb of charge in the monitor ionisation chamber M was measured using the calorimeter. Next, the ratio of charges collected, during equal times, by the monitor and the standard ionisation chamber C was determined. The product of the two quantities gives the result. The second method employed was as follows. A thin-walled ionisation chamber was placed inside a block of a material. A measurement was then made of the ionisation in the chamber as a function of the thickness of the material in front of it (transition curve). Since, in the case of complete

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Comparison of Ionisation and Calorimetric Measurements of the Intensity of γ-rays from a Synchrotron

absorption of the γ-beam, all its energy is, in the last analysis, used in ionisation, it follows that the incident energy U of the γ-ray can be related to the ionisation in the air-filled region of the chamber by Eq (1), where W is the energy necessary to produce one pair of ions in air, $\bar{\rho}(t)$ is the ratio of the ionisation losses per cm of path in the substance employed and in air (averaged over electron energies) and I(t) is the number of ion pairs per cm of path in the air gap at a depth t . If $\bar{\rho}$ is independent of t then the integral $\int_0^\infty I(t)dt$ is equal to the area under the transition curve.

Figure 5 shows the ionisation chamber which was used. The high-voltage electrode B and the collecting electrode C were in the form of aluminium foils. 0.05 mm thick. The back-scatterer P also serves as the second high-voltage electrode. The depth of the working volume is 2 cm. With such a dimension of the air gap, electrons scattered

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Comparison of Ionisation and Calorimetric Measurements of the Intensity of γ-rays from a Synchrotron

through large angles will be deflected sideways and will not contribute to the ionisation. All the measurements were extrapolated to zero thickness of the air gap. The experimental technique was similar to that in the case of the calorimetric method. It was found that the calorimetric method is the most direct and accurate. The only assumption in this method is that all the absorbed γ-ray energy is converted into heat and this holds provided chemical changes and changes in the crystalline structure do not take place. The transition-curve method for high Z materials (lead) gives a low result. The main reason lies probably in that the extrapolation to zero thickness of the ionisation chamber cannot be assumed as linear. However, in the case of low Z materials such as carbon, aluminium and copper, the agreement between the calorimetric method and the transition-curve method is sufficiently good. There are 9 figures, 1 table and 9 references, 1 of which is Soviet and 8 are English.

Card5/6

69427
S/139/60/000/01/001/041
E032/E314

Comparison of Ionisation and Calorimetric Measurements of the Intensity of γ-rays from a Synchrotron

ASSOCIATION: Leningradskiy fiziko-tekhnicheskiy institut AN SSSR
(Leningrad Physico-technical Institute of the Ac.Sc.USSR)

SUBMITTED: December 27, 1958

Card 6/6

81108

S/057/60/030/04/05/009
B004/B002

21 2000

AUTHORS: Kruglov, S. P., Lopatin, I. V.

TITLE: Investigation of the Energy Losses of a Bremsstrahlung Beam From a Calorimetric Absorber. I 79

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 4, pp. 424-432

TEXT: The authors discuss the calorimetric measurement of the energy of accelerator bremsstrahlungs. Since the absorption of the total energy of γ-radiation yields too large Pb-absorbers with low sensitivity, small absorbers are used, and a correction of the energy loss is necessary. The present paper deals with the measurement of this energy loss. Processes developing in the absorber by γ radiation are described, and the following secondary effects are discussed: 1) γ quanta which underwent a Compton scattering; 2) γ quanta from the annihilation of positrons and electrons; 3) bremsstrahlung of the electrons. The intensity of the radiation leakage was measured by means of a plexiglass ionization chamber (Fig. 1). Fig. 2 shows the experimental setup by means of the

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81108

Investigation of the Energy Losses of a Brems- S/057/60/030/04/05/009
strahlung Beam From a Calorimetric Absorber. I B004/B002

synchrotron of the authors' institute. The measuring chamber was arranged in a circular path at different angles θ with respect to the absorber. The standard used was an ionization chamber placed upon the beam axis. All data obtained at 760 torr and 20°C were referred to its indications.

The measuring chamber was calibrated by means of Co^{60} and 120 kev X-ray tubes in the rentgenometricheskaya laboratoriya VNIIM (Radiometric Laboratory of the All-Union Scientific Research Institute of Metrology imeni D. I. Mendeleyev) (Head: M. F. Yudin). Fig. 3 shows the dependence of the chamber sensitiveness on the thickness of the plexiglass. In the experiment, a linear absorption coefficient of $\tau = 0.50 \pm 0.03$ cm^{-15} was obtained for all θ. Fig. 4 shows the radiation leakage reduction in plexiglass at different θ, and Figs. 5-7 and Table 1 give the angular distributions of the energy losses ΔU measured in three different absorbers. The results were calorimetrically examined (Table 2). The authors found the radiation leakage to be anisotropic, a fact which explains the shift of the absorption maxima. The second maximum at 140° is not affected by the diameter of the absorber (Fig. 8, Table 3). Hence, it was concluded that a gamma beam can never be completely absorbed, since

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81108

Investigation of the Energy Losses of a Brems- S/057/60/030/04/05/009
strahlung Beam From a Calorimetric Absorber. I B004/B002

1.5% of the incident energy is always irradiated in angles wider than 90°, and the energetic albedo of Pb, i.e. at E_{max} - 85 mev, has the value of 1.5%. The authors thank Professor A. P. Komar for discussions, and Z. Kovarzh for his assistance in the measurements. There are 8 figures, 3 tables, and 10 references: 4 Soviet and 6 American.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR Leningrad (Institute of Physics and Technology of the AS USSR, Leningrad)

SUBMITTED: August 28, 1959

Card 3/3

84564

S/057/60/030/011/009/009
B006/B054

9,6150
21.5300 (1033, 1518)

AUTHORS: Komar, A. P. and Kruglov, S. P.

TITLE: A Quantum Meter for Measuring the Bremsstrahlung Energy Flux From Betatrons and Synchrotrons, and Its Investigation at $E_{\gamma max} < 100$ Mev

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 11, pp. 1369-1380

TEXT: The demands made on an instrument for measuring bremsstrahlung energy flux are theoretically met by the new quantum meter developed by Wilson (Ref. 7). Wilson tested the instrument in the $E_{\gamma max}$ range from 300 to 800 Mev. The present paper gives the results of quantum meter tests in the range $E_{\gamma max} < 100$ Mev, in which the independence of the instrumental factor on $E_{\gamma max}$ and on the diameter of the gamma beam at the input of the instrument is not so clear as at high energies. The authors also give a mathematically accurate theory for the quantum meter which was missing

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A Quantum Meter for Measuring the Bremsstrahlung Energy Flux From Betatrons and Synchrotrons, and Its Investigation at $E_{\gamma max} < 100$ Mev

S/057/60/030/011/009/009
B006/B054

in Ref. 7. In chapter I, they describe the operation of the quantum meter and the theory of transition curves, and discuss its use for energy flux measurement. The design of the quantum meter is illustrated in Fig. 2, and the instrumental factor (for argon, CO_2, and air filling) is thoroughly calculated. Table 3 compares the theoretical and experimental instrumental factors (for argon and air) in 10^{18} Mev/coulomb units. Chapter II describes the methods and results of the authors' experiments. Fig. 6 shows the experimental arrangement. First, the authors studied the dependence of the sensitivity of the quantum meter on a parallel shift of its axis with respect to the beam axis (Curve 1, Fig. 7). The curve obtained is symmetrical, and shows a minimum when displaced by about 7 cm. For comparison, the authors give the curve measured by Wilson at $E_{\gamma max} = 800$ Mev (Curve 3), as well as the curve obtained from an improved quantum meter; this curve (2) shows no minimum. The diagram of Fig. 8 illustrates the sensitivity of the instrument as a function of the angle of rotation round the beam axis. Fig. 9 shows $I_K/I_C = B(E_{\gamma max})/A$, where I_K/I_C is the ratio of the currents of the quantum meter and of the stand-

A Quantum Meter for Measuring the Bremsstrahlung Energy Flux From Betatrons and Synchrotrons, and Its Investigation at $E_{\gamma max}$ < 100 Mev

S/057/60/030/011/009/009
B006/B054

ard; $B(E_{\gamma max})$ is the constant of the standard for a given $E_{\gamma max}$, and A is the instrumental factor of the quantum meter (Table 3). Finally, the results are discussed in chapter III. The most important result of experiments made in the range $E_{\gamma max}$ = 53 + 85 Mev was that A showed a very small energy dependence, even at lower energies. At $E_{\gamma max}$ = 300 Mev, for example, A is only 4.5% smaller than at $E_{\gamma max}$ = 85 Mev. Some explanations are offered for the increase of A with decreasing $E_{\gamma max}$. I. Tamm and S. Z. Belen'kiy are mentioned. There are 9 figures, 3 tables, and 20 references: 5 Soviet and 15 US.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR Leningrad (Institute of Physics and Technology of the AS USSR, Leningrad)

SUBMITTED: March 25, 1960

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84564

A Quantum Meter for Measuring the Bremsstrahlung Energy Flux From Betatrons and Synchrotrons; and Its Investigation at $E_{\gamma max} < 100$ Mev

S/057/60/030/011/009/009
B006/B054

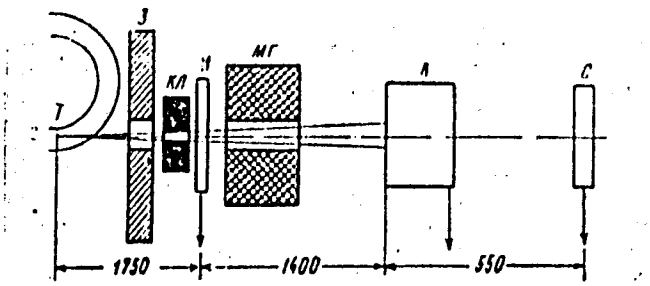

Fig. 6: Experimental arrangement

T - synchrotron target; Э - lead shield; КЛ - collimator; M - monitor ($4.0\ g/cm^2$ Al); МГ - magnet which purifies the quantum beam from electrons; K - quantum meter; C - standard ionization chamber.

Card 4/4

KRUGLOV, S. P. Cand Phys-Math Sci -- "Comparison of ionizing and calorimetric measurements of the flow of gamma-radiation energy from electronic accelerators." Len, 1961 (Radium Inst im V. G. Khlopin, Acad Sci USSR). (KL, 1-61, 183)

S/058/63/000/002/007/070
A059/A101

AUTHORS: Kruglov, S. P., Lopatin, I. V.

TITLE: Determination of the energy dissipation of a γ-beam from the absorber of a calorimeter for $E_{\gamma\text{-max}}$ = 85 Mev.

PERIODICAL: Referativnyy zhurnal, Fizika, no. 2, 1963, 70, abstract 2A457 (In collection: "Elektron. uskoriteli", Tomsk, Tomskiy un-t, 1961, 192 - 202)

TEXT: The nature and the magnitude of the energy dissipation of a γ-beam from the absorber of a calorimeter are studied. See also RZhFiz, 1962, 5B44.

[Abstracter's note: Complete translation]

Card 1/1

KRUGLOV, S.P.

Comparison of ionization and calorimetric measurements of an energy flux of bremsstrahlung from a synchrotron. Zhur. tekh. fiz. 31 no.9:1092-1103 S '61. (MIRA 14:8)

1. Fiziko-tekhnicheskiy institut imeni A.F. Ioffe AN SSSR, Leningrad.
(Bremsstrahlung)
(Synchrotron)

25036
S/057/61/031/007/019/021
B104/B206

24.6410

AUTHORS: Kruglov, S. P. and Lopatin, I. V.

TITLE: Electron spectrum forming in light substances through bremsstrahlung with $E_{\gamma max}$ = 80 Mev

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 7, 1961, 876 - 887

TEXT: The authors describe a method for the calculation of electron spectra of light substances. Introduction and first paragraphs deal with the measurement of the energy flux of γ radiation according to Bragg-Gray (L. H. Gray, Proc. Roy, Soc., 156A, 578, 1936) and determination of the spectrum of the electrons developing in the substance. The behavior of the electrons and photons in the substance in which cascade showers develop, is described by the complicated integro-differential equations of the cascade theory. Exact solutions of these equations are not known, and approximations by S. Z. Belen'kiy (deceased) and I. P. Ivanenko (UFN, 59, 624, 1959) are referred to. Since the energy, beginning from which the cascade processes play an important part, is the greater the lower the atomic number, these processes may be neglected for light substances

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Electron spectrum forming...

(graphite, water, aluminum), if the energy of the photons and electrons does not exceed some ten Mev. In this case the electron spectrum may be determined by calculating the initial energy distribution of the electrons produced through γ-radiation by taking their moderation into account. H. Brysk (Phys. Rev., 96, 419, 1954) proposed such a calculation which is, however, complicated and requires much time. Brysk et al. (Am. J. Roentgenol., Radium Therapy, 74, 323, 1955) gave a simplification of this method. The authors develop a method for calculating the electron spectra in light substances, following the method developed by D. V. Cormarok et al. (Brit. J. Radiol., 25, 369, 1952; Nucleonics, 12, no. 10, 40, 1954). The authors obtain expression

$$N(E)=\frac{dR}{dE}\int_{E}^{E_{T\,max}} N(E_0)\,dE_0=\frac{1}{S_z}\int_{E}^{E_{T\,max}} N(E_0)\,dE_0, \qquad (3),$$

for the energy distribution of the electrons where S_z is the total moderating power of the substance in Mev/cm. The spectrum by L. I. Schiff (Phys. Rev., 83, 252, 1951) was used for calculating the initial energy distribution of the electrons (Fig. 1). Fig. 2 shows the dependences of the differential cross sections of the Compton effect (curve 1) and those

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Electron spectrum forming...

of pair formation (curve 2) in aluminum on the photon energy at fixed electron energy. Curve 3 is the sum of the two cross sections, i. e., it gives in Mev the total number $N(E_0, h\nu)$ of the electrons and positrons of a given energy E_0, which are produced by one photon per 1 cm^2. From this, the total number of electrons is then calculated with $\int_0^{h\nu_{max}} I(h\nu)N(E_0, h\nu)dh\nu$. The graphically determined values of integrals of the form $\int_{h\nu_1}^{h\nu_2} N(E_0, h\nu)dh\nu$ are given in a table, with the aid of which the initial energy distribution of the electrons produced in graphite and aluminum by any γ-radiation with the maximum energy of 80 Mev, may be calculated. The authors further consider the weakening of the γ-radiation with increasing penetration depth when calculating the energy distribution of the electrons. The γ-radiation is assumed to change exponentially with the depth. In this connection the authors refer

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Electron spectrum forming...

to C. White-Grodstein (NBS circular, 583, 1957). Fig. 5 gives a graphical representation of the energy distributions of the electrons at various depths in Al and graphite, calculated by formula (4). The authors thank Professor A. P. Komar for the discussion and Z. Kovarik for assistance with the calculations. There are 5 figures, 2 tables, and 27 references: 3 Soviet-bloc and 24 non Soviet-bloc.

ASSOCIATION: Fiziko-tekhnicheskiy institut im A. F. Ioffe AN SSSR
Leningrad (Physicotechnical Institute imeni A. F. Ioffe, AS USSR Leningrad)

SUBMITTED: August 11, 1960

Card 4/6

31721
S/057/61/031/012/007/013
B104/B112

24.6730

AUTHOR: Kruglov, S. P.

TITLE: Comparison of ionization and calorimetric measurements of the energy flux of synchrotron bremsstrahlung. II

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 12, 1961, 1451-1461

TEXT: In a previous paper (S. P. Kruglov, ZhTF, XXXI, no. 9, 1092, 1961), the author compared results of bremsstrahlung measurements by the indirect ionization method with those achieved by the direct calorimetric one. The determination of ionization current curves in a slotted ionization chamber, as proposed by W. Blocker et al. (Phys. Rev., 79, 419, 1950), was shown to give much smaller values of the bremsstrahlung energy flux. The following potential causes for the deviation are examined: 1) energy losses from radiation leakage and photonuclear reactions; 2) underestimation of ionization losses due to electron scattering out of the chamber; 3) inapplicability of the Bragg-Gray principle. The relevant corrections are determined. In light elements, the deviation was found to result from the neglect of the radiation leakage from the absorber and

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Comparison of ionization and...

by energy consumed in photonuclear reactions. In elements with higher Z (Pb, Cu), the deviation is caused by a wrong consideration of the ionization losses from lateral electron scattering. New measurements were made with a so-called extrapolation chamber with continuously variable gap. With it, lateral electron scattering could be determined very exactly. Bearing in mind the radiation leakage and photonuclear reactions, the results agree well with those of calorimetric measurements. The quantometer proposed by R. R. Wilson (Nucl. Instruments, 1, 101, 1957) was of great importance for the measurements. Professor A. P. Komar is thanked for interest and help, I. V. Lopatin for help with the measurements, and the leader of the synchrotron team for cooperation. There are 8 figures, 2 tables, and 18 references: 3 Soviet and 15 non-Soviet. The four most recent references to English-language publications read as follows: H. W. Koch, J. M. Wickoff, Phys. Rev., 117, 1261, 1960; W. R. Dixon, Can. J. Phys., 33, 785, 1955; Proceedings of the Third Annual Rochester Conference, December, 18 - 20, p. 23 and 26, 1952; R. L. Walker, J. G. Teasdale, V. Z. Peterson, J. I. Vette. Phys. Rev., 99, 210, 1955.

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31721
S/057/61/031/012/007/013
B104/B112

Comparison of ionization and...

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR Leningrad (Physicotechnical Institute imeni A. F. Ioffe AS USSR, Leningrad)

SUBMITTED: October 3, 1960

X

Card 3/3

S/057/62/032/011/012/014
B104/B102

AUTHORS: Kruglov, S. P., and Lopatin, I. V.

TITLE: A study of the energy leakage of a bremsstrahlung ray from the absorber of a calorimeter. II

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 11, 1962, 1399-1403

TEXT: In Part I of this paper (S. P. Kruglov, I. V. Lopatin, ZhTF, 30, 424, 1960) the angular distribution of the energy leakage from absorbers of length l = 120 mm and diameters D = 55, 75, 95, and 120 mm was studied for an energy of $E_{\gamma max}$ = 85 Mev. The diameter of the ray on the surface of the absorber was d = 35 mm, in some measurements it was 20, 45, 60 or 80 mm. Now the same experimental arrangement is used to determine the dependence of the energy leakage from a cylindrical lead absorber as a function of its diameter and of its length for different values of $E_{\gamma max}$ (Figs. 2 and 4). Using these results, the energy leakage from absorbers of different lengths is represented in Fig. 5 as a function of the energy leakage from an absorber of length 120 mm. The curves enable the energy

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A study of the energy leakage ...

leakage of different absorbers to be estimated if that of an absorber 120 mm long is known. Absorbers shorter than 60 mm are found to be unsuitable. The fraction of the ray energy carried away by the transmitted component is estimated on the basis of the papers of L. I. Schiff (Phys. Rev., 83, 252, 1951) and G. White-Grodstein (NBS Circular, No. 583, 1957) (Fig. 6). An experimenter developing a calorimeter has to determine those absorber dimensions that will guarantee a given energy leakage. For this purpose a large number of diagrams based on the results obtained are given, supplying the desired dimensions for a lead absorber with different $E_{\gamma max}$ (50, 85 and 300 Mev). There are 7 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR im. A. F. Ioffe, Leningrad (Physicotechnical Institute AS USSR imeni A. F. Ioffe, Leningrad)

SUBMITTED: June 15, 1961 (initially)
October 30, 1961 (after revision)

Fig. 2. Energy leakage as a function of the absorber diameter. Legend: The curves 1 to 5 refer to the ray diameter of 20, 35, 45, and 80 mm.

Card 2/5

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B178/B104

21.6600

AUTHORS: Komar, A. P., Academician AS UkrSSR, Kruglov, S. P., and Lopatin, I. V.

TITLE: Sensitivity determination of a quantometer for energies of 15-300 Mev

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 145, no. 2, 1962, 309-311

TEXT: A quantometer is used to measure the area $S_T = \int_0^\infty i(t)dt$ bounded by the ionization current $i(t)$ and produced by γ-irradiation of a body. This area is proportional to the energy current

$$U = \frac{\omega \bar{Q}}{e} \frac{\delta_z}{\delta_g} S_T$$

where ω is the energy consumed for the production of ion pairs; e is the electron charge; $\bar{Q}$ is the mean ionisation loss; δ_z is the density of the matter; and δ_g is the density of the gas. The value of S as determined

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Sensitivity determination of a...

with a quantometer for $E_{max} > 100$ Mev differs from S_T by 1 %. In this case, the sensitivity of the instrument is $C = \frac{I}{U} = \frac{e}{\omega \bar{Q}} \frac{\delta_g}{\delta_z} \frac{\bar{a}}{X_0}$, where X_0 is the plate diameter of a multiplate ionization chamber, and $\bar{a}$ is the mean spacing of the plates. At energies of ~ 100 Mev, C remains constant. For very low energies, $C^* = \frac{e}{\omega \bar{Q}} \frac{\delta_g}{\delta_z} \frac{\bar{a}}{X_0} \frac{S}{S_T}$ and $\bar{Q}$ increases by 2.5 % as E_{max} drops from 100 to 15 Mev. For these energies it is necessary to compare the data with a calorimeter. The experimental arrangement is shown in Fig. 1. The curves obtained for the sensitivity of the quantometer are normalized using experimental data, and the sensitivity can thus be represented as a function of E_{max} in the range 15-300 Mev. The error is less than 10 %. There are 4 figures.

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Sensitivity determination of a...

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe Akademii nauk SSSR (Physicotechnical Institute imeni A. F. Ioffe of the Academy of Sciences USSR)

SUBMITTED: April 14, 1962

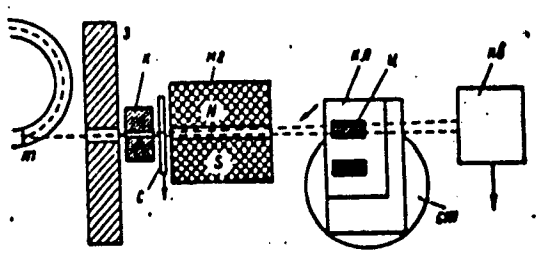

Fig. 1

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ACCESSION NR: AP3004889 S/0120/63/000/004/0053/0058

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AUTHOR: Kruglov, S. P.; Lopatin, I. V.

TITLE: High-sensitivity calorimeter for measuring energy flux of bremsstrahlung up to 10 sup -5 w 10 19

SOURCE: Pribory*i tekhnika eksperimenta, no. 4, 1963, 53-58

TOPIC TAGS: calorimeter, bremsstrahlung, energy flux

ABSTRACT: The calorimeter is intended for measuring weak bremsstrahlung from betatrons and synchrotrons. The article describes the following design and development points: 2×10^{-6} to 2×10^{-5} w energy is available for the absorber of a thermistor-type differential calorimeter; two 7.5-cm-diameter, 8-cm-long cylindrical lead absorbers are used; the absorbers are heat-insulated and placed into a thermostat-controlled oil bath; Wheatstone-bridge measuring circuit is used; calibration, errors, and corrections for incomplete absorption of the beam

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ACCESSION NR: AP3004889

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by the calorimeter; techniques of measurement. "The authors are thankful to A. P. Komar for discussing the project and making a number of valuable comments, and to V. M. Suvorov for his help with the experimental work on the synchrotron." Orig. art. has: 6 figures, 8 formulas, and 1 table.

ASSOCIATION: Fiziko-technicheskiy institut AN SSSR (Physico-Technical Institute, AN SSSR)

SUBMITTED: 09Aug62 DATE ACQ: 28Aug63 ENCL: 00

SUB CODE: NS NO REF SOV: 006 OTHER: 003

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L 18474-63 EWT(m)/BDS AFFTC/ASD

ACCESSION NR: AP3005506 S/0057/63/033/008/0949/0953

AUTHOR: Komar, A.P.; Kruglov, S.P.; Lopatin, I.V.

TITLE: Bremsstrahlung energy measurement with a "standard" ionization chamber

SOURCE: Zhurnal tekhnicheskoy fiziki, v.33, no.8, 1963, 949-953

TOPIC TAGS: energy measurement, gamma-ray, bremsstrahlung, ionization chamber, standard instrument

ABSTRACT: The "standard" ionization chamber is a simple 130 mm diameter cylindrical chamber with copper end plates that was built and calibrated at the Physical-Technical Institute, Leningrad, with the intention that it be copied elsewhere and employed, with the Leningrad calibration, as a secondary standard for the measurement of the energy flux in collimated gamma-ray beams. The construction of the chamber is shown in the Enclosure. The instrument was calibrated against a calorimeter, using synchrotron bremsstrahlung, over the range from 15 to 90 MeV. The sensitivity is about 2×10^{-9} coulomb/MeV and varies by about 14% over this range. The sensitivity also varies slightly with the beam diameter, dropping by about 5% as the beam diameter is increased from small values to 100 mm. The paper also briefly

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ACCESSION NR: AP3005506

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describes a simple instrument, consisting of a standard capacitor and an electronic electrometer, for measuring the ionization current. "The authors express their gratitude to V.S.Iskov, I.P.My*sov, V.M.Suvorov, I.A.Pronin and Yu.K.Pereskokov, who participated in the measurements." Orig.art.has: 6 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut im.A.F.Ioffe AN SSSR, Leningrad (Physico-technical Institute, AN SSSR)

SUBMITTED: 30Jul62 DATE ACQ: 06Dec63 ENCL: 01

SUB CODE: PH NO REF SOV: 000 OTHER: 001

Card 2/2

KOMAR, A.P.; KRUGLOV, S.P.; LOPATIN, I.V.

Comparison of absolute energy measurements in a beam of bremsstrahlung conducted in laboratories of various countries. Zhur. eksp. i teor. fiz. 45 no.3:824-825 S '63. (MIRA 16:10)

1. Fiziko-tekhnicheskiy institut imeni A.F. Ioffe AN SSSR.
(Bremsstrahlung—Measurement)

ACCESSION NR: AP4018371 S/0120/64/000/001/0088/0090

AUTHOR: Kruglov, S. P.; Lopatin, I. V.

TITLE: Extrapolation ionization chamber for high-energy gamma-ray measurements

SOURCE: Pribory* i tekhnika eksperimenta, no. 1, 1964, 88-90

TOPIC TAGS: ionization chamber, extrapolation ionization chamber, bremsstrahlung spectrum, absorbed energy, absorbed energy depth distribution, ionization chamber variable air gap

ABSTRACT: A new extrapolation chamber intended for measuring ionization vs. airgap relations is described; it was used for measurements with 15-85 Mev bremsstrahlung. The chamber gap is adjustable within 45-1 mm, with a setting error of ± 0.03 mm or less, which permits extrapolation of specific ionization down to a zero airgap. The chamber permits varying the thickness of test

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ACCESSION NR: AP4018371

material from 1 to 450 mm (see Enclosure 1). The chamber allowed a clarification of the cause of a discrepancy between the gamma-quantum energy measured by the calorimeter method and same measured by ionization-current vs. thickness-of-material curves. Ionization losses were misjudged because of the lateral scattering of electrons which resulted in an energy stream underestimated by 25% and 15% for Pb and Cu, respectively. "The authors wish to thank A. P. Komar and V. N. Dy*n'kov for their assistance in developing the chamber." Orig. art. has: 2 figures.

ASSOCIATION: Fiziko-tekhnicheskiy institut AN SSSR (Physico-Technical Institute, AN SSSR)

SUBMITTED: 17Jan63 DATE ACQ: 18Mar64 ENCL: 01

SUB CODE: NS NO REF SOV: 002 OTHER: 003

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