ERDEY-GRUZ, Tibor; MAJTHENYI, Lajos; KUGLER, Elvira

Determination of the electrolytic dissociation constant at 25 C by the conductibility measurement. Magy kem folyoir 69 no.2:68-73 F '63.

1. Eotvos Lorand Tudomanyegyetem Fizikai-Kemiai es Radiologiai Tanszeke, es Elektrokemiai Akademiai Kutato Csoport. 2. "Magyar Kemiai Folyoirat" felelos szerkesztoje (for Erdey-Gruz).

ERDEY-GRUZ, Tibor; MAJTHENYI, Lajos

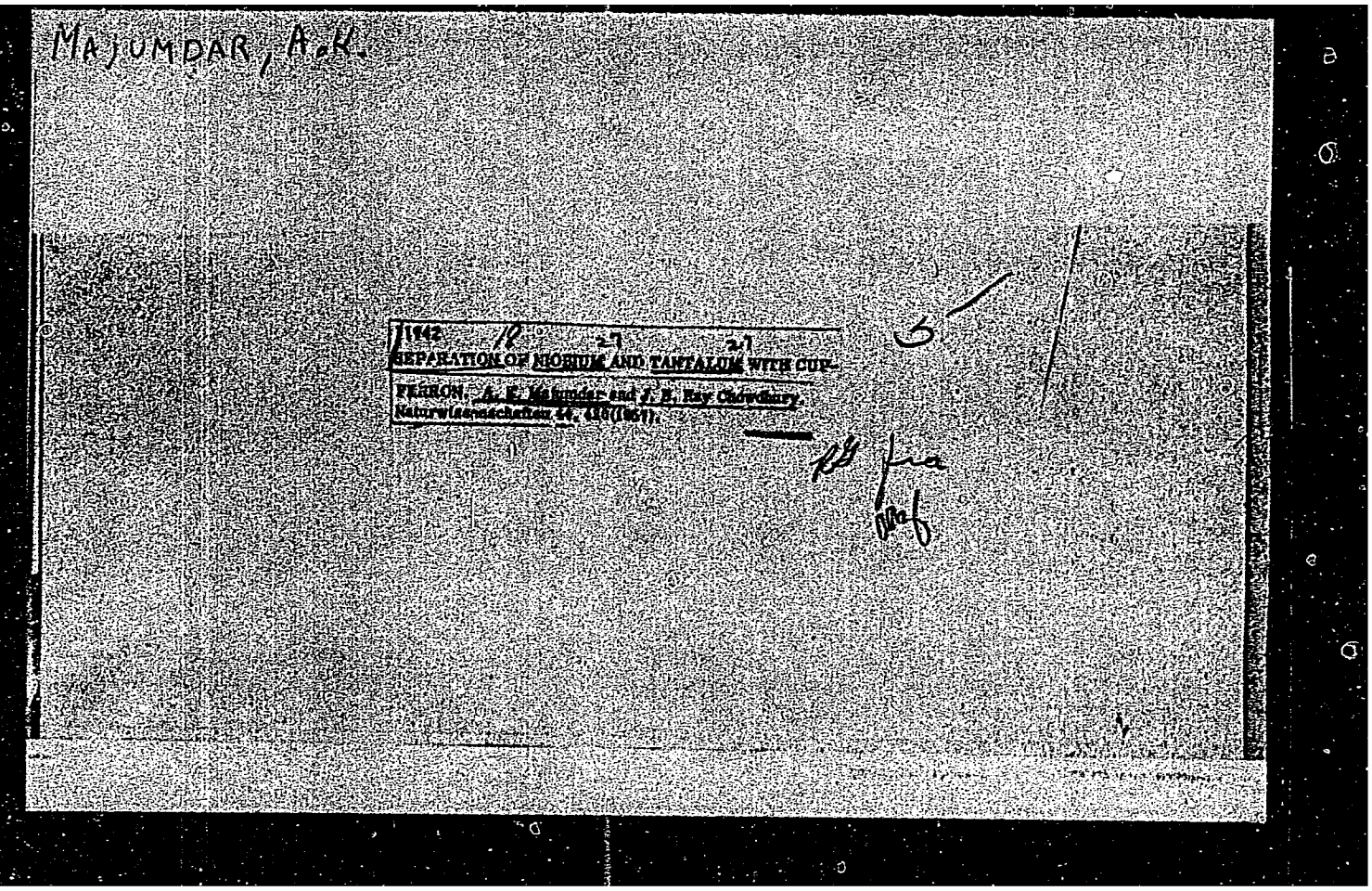
Migration mechanism of hydrogen and hydroxyl ions. Pt. 5.
Magy kem folyoir 65 no. 5:167-174 My '59.

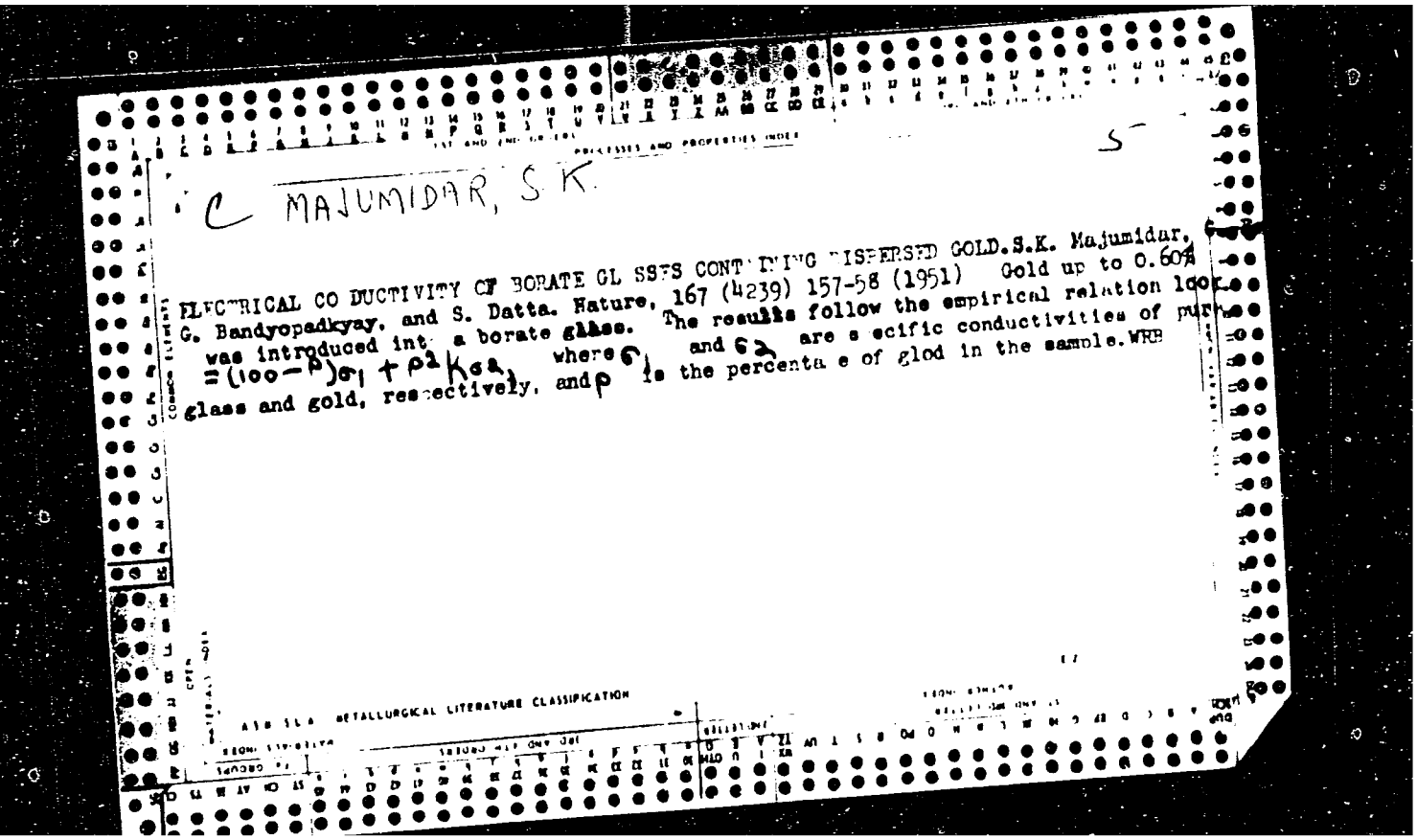
1. Eotvos Lorand Tudomanyegyetem Fizikai-Kemiai Tanszeke, Budapest.
2. "Magyar Kemiai Folyoirat" felelos szerkesztoje (for Erdey-Gruz).

ERDEY-GRUZ, Tibor; MATHENYI, Lajos

Migration mechanism of hydrogen and hydroxyl ions. Pt. 6.
Magy kem folyoir 65 no. 6:212-218 Je '59.

1. Eotvos Lorand Tudomanyegyetem Fizikai-Kemiai Tanszek, Budapest.
2. "Magyar Kemiai Folyoirat" felelos szerkesztoje (for Erdey-Gruz).





C MAJUMIDAR, S.K.

ELECTRICAL CONDUCTIVITY OF BORATE GLASSES CONTAINING DISPERSED GOLD. S.K. Majumidar, G. Bandyopadkyay, and S. Datta. Nature, 167 (4239) 157-58 (1951) Gold up to 0.60% was introduced into a borate glass. The results follow the empirical relation $\sigma = (100-p)\sigma_1 + p^2 K \sigma_2$, where σ_1 and σ_2 are specific conductivities of pure glass and gold, respectively, and p is the percentage of glod in the sample. WRB

A1B 11A METALLURGICAL LITERATURE CLASSIFICATION

MAJUNKE-DURISOVA, Veronika, MUDr.

Experimental study of biogenic stimulatory substances by biological test. Cesk. ofth. 11 no.3:162-167 June 55.

1. Z ocnej kliniky SU v Bratislave - prednosta prof. dr. A Gala.
(SKIN TRANSPLANTATION, experimental
stimulating eff. on fibroplast in chicken.)

[illegible], [illegible].

Obtaining the [illegible] carbohydrate content of Jerusalem artichokes. [illegible]

[illegible] (Mezogazdasagi [illegible] Tudomanyos [illegible], [illegible] Szakosztaly) Budapest, Hungary
Vol. [illegible], no.7, July 195[illegible]

Monthly list of East European Accessions [illegible], Vol. [illegible], [illegible], Dec. [illegible]
Uncl.

APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001031420005-5"

MAJZEL, C.

Prolonging the life of boiler tubes of lye condensers in aluminum factories. Tr. from the Russian. p.187. (Kohaszati Lapok. Budapest, Vol. 11, no. 4, Apr. 1956)

MAJZIK, Gabor, dr.

Important problems in fighting infantile tuberculosis. Tuberk. kerdesei 8 no.5:144-149 Oct 55.

1. Statisztika: Nyaradyiva dr.
(TUBERCULOSIS, in inf. & child
in Hungary, prev. & control by BCG vacc. & screening, organiz. & management (Hun))
(BCG VACCINATION
in Hungary, organiz. & management (Hun))

MAJZIK, Gabor, dr.

The week of the antituberculosis campaign in 1956. Tuberk. kerdesei 9 no.4:145-147 Aug 56.

(TUBERCULOSIS, prev. & control
in Hungary, week of antituberculosis campaign in 1956. (Hun))

BOSZORMENYI, Miklos, dr.; FAUSZT, Imre, dr.; BARABAS, Mihaly, dr.; BARAT, Iren, dr.; JAKAB, Zoltan, dr.; MAJZIK, Gabor, dr.; SCHWEIGER, Otto, dr.

The choice of drug to be combined with INH in the initial drug therapy of tuberculosis patients. Tuberkulozis 15 no.12:360-364 D '62.

1. Az Orszagos Koranyi Tbc Intezet (igazgato Foldes Istvan dr.) a Matrahazai Allami Tbc Gyogyintezet (igazgato foorvos: Lanyi Andor dr.) es a Csakvari Tbc Gyogyintezet (igazgato foorvos: Majzik Gabor dr.) kozlemenye.

(ISONIAZID) (STREPTOMYCIN) (AMINOSALICYCLIC ACID) (THIOSEMICARBAZONES) (TUBERCULOSIS, PULMONARY)

CZECHOSLOVAKIA/Optics. K

Abs Jour: Referat Zhur-Fizika, 1957, No 4, 10399

Author : Kunh Arno, Majzis Jan.
Inst : Research Institute for Electrotechnical Physics, Prague, Czechoslovakia.
Title : Effect of Methyl Alcohol on Luminescence Properties of Solutions Used in Scintillation Counters.

Orig Pub: Czechcsl. fiz. zh., 1956, 6, No 4, 401-405

Abstract: An investigation is made of the effect of methyl alcohol, the presence of water, and variation in temperature on the effectiveness of the luminescent solutions activated by para-terphenyl or 1.4-diphenylbutadeine. The materials used for measurements were purified quite thoroughly. The optimum concentration of activator, 0.5%, was chosen for the investigations. The methyl alcohol reduces considerably the effectiveness of the solutions, activated by para-terphenyl and 1.4-diphenylbutadeine. At 30% concentration of methyl alcohol, the initial effectiveness of the solutions is

Card : 1/2

CZECHOSLOVAKIA/Optics. K

Abs Jour: Referat Zhur-Fizika. [illegible]

reduced by 39%. The influence of water, which might be contained in the methyl alcohol, is insignificant. At a content of 1% water, the luminescent properties of the solution are reduced by nearly approximately 5%. The effectiveness of the luminescent solution falls considerably with increasing solution temperature. The content of methyl alcohol has no influence on the spectral position of the transmission band of the solution. In conclusion, it is indicated that the 0.5% solution of para-terphenyl and toluene can be diluted by 30% methyl alcohol and the luminescent properties of such a solution will still be satisfactory for the measurement of radioactive argon Cl^{38}, while 1,4-diphenylbutadiene, owing to its small luminescence efficiency, is unsuitable for these measurements.

Card : 2/2

MAJZIK, Laszlo (Szentes)

Socialist complex brigade in the Szentes railroad station.
Magy vasut 7 no.17:3 2 3 '63.

MAJDLIK, Miroslav, [illegible]

Action plan of the motor bus transportation of the Czechoslovak Automobile Transport. Silnice dopravy 11 no.8:2-3 Ag '63.

1. Ministerstvo dopravy.

MAJZLIK, Miroslav, promovany [illegible]

For development of the Soviet weak truck transportation. Strava no.4:252-255 '64.

Poland/Chemical Technology - Chemical Products and Their Application. Dyeing and Chemical Treatment of Textiles, I-16

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 62886

Author: Majzner, Jozef; Jedrusiak, Zenon; Chmielewski, Bronislaw

Institution: None

Title: Direct Printing with Sulfur Dyes Using Ethylene Chlorohydrin

Original Periodical: Druk bezposredni barwnikami siarkowymi przy uzyciu chlorhydryny etylenu, Przem. wlokienniczny, 1955, 9, No 1, 18-19; Polish

Abstract: Description of a method of printing fabrics with sulfur dyes using ethylene chlorohydrin as a compound that combines with S^{2-} ions (to form thiodiethylene glycol) thereby preventing corrosion of the copper printing rolls.

Card 1/1

POLAND/Chemical Technology - Chemical Products and Their Applications. Dyeing and Chemical Treatment of Textiles. K-6

Abs Jour : Ref Zhur - Khimiya, No 2, 1958, 6696

Author : Majzner, Jedrusiak

Inst : -

Title : On Improving the Properties Urea-Formaldehyde Resins.

Orig Pub : Przem. wlokienniczy, 1956, 10, No 7, 319-321

Abstract : Two types of urea-formaldehyde condensation taking place when mixtures of mono- and dimethyl urea are formed and recommended for finishing rayon fabrics so as to improve their external appearance and to decrease wrinkle-formation, are described.

Card 1/1

POLAND / Chemical Technology, Chemical Products and Their Application. Part 4 - Dyeing and Chemical Treatment of Textile Materials

Abs Jour : Ref. Zhur. Khimiya, No 4, 1958, 13309

Author : Jozef Majzner, Jeremi Mazurowski.

Inst : Not given

Title : Polane Dyeing with Unsoluble AzO-Dyes Formed on Fiber.

Orig Pub : Przem. wlokienniczy, 1957, 11, No 1, 20 - 23.

Abstract : Dyeing of the polyamide polane fiber using azotols (I) and azoamines (II) of Polish and partly German origin was carried out parallelly by 3 methods. The first method based on preliminary application of I to the fabric with following combination with dinitrated II is carried out impregnating the fabric in 2 variations: a/ either with an alkaline I solution, 2/ or with a suspension of I. By the se-

Card 1/3

POLAND / Chemical Technology, Chemical Products and Their Application. Part 4 - Dyeing and Chemical Treatment of Textile Materials. H-33

Abs Jour : Ref. Zhur. Khimiya, No 4, 1958, 13309.

Abstract : cond method, the fabric is soaked first with an aqueous dispersion or solution of the hydrochloric salt of II, after which the dinitration of II on the fiber and the combination under the action of the I solution are carried out. The third method consists in a simultaneous treatment with I and II with following dinitration and combination in an acid solution of $NaNO_3$. According to one variation, a paste of I and II is made with the addition of alcohol, NaOH and hot water; this paste is applied to the fabric at 70 to 80° in the duration of 20 min., and the dinitration and combination is carried out in a solution containing 2 g of $NaNO_2$ and 5 mlit of 80%-ual HCOOH per lit at 70 to 80°. According to another variation, fine dispersions of I and II are prepared by precipitating I from an alkaline solution under the

Card 2/3

H-34

POLAND/Chemical Technology - Chemical Products and Their Application. Dyeing and Chemical Treatment of Textiles.

Abs Jour : Ref Zhur - Khimiya, No 8, 1958, 27404

Author : Majzner Jozef, Jedrusiak Zenon, Brzezinski Jerzy

Inst : -

Title : The Use of Bisulfite as a Means for Binding Free Formaldehyde in Impregnation Baths of Wrinkling Resistant Finishing .

Orig Pub : Przem. wlokienniczy, 1957, 11, No 6, 285-289

Abstract : Description of results of laboratory and manufacturing tests of the use of Na-bisulfite (I) for the binding of free formaldehyde (II) in impregnation baths containing Antimmol FM (urea-formaldehyde condensation product) (III). The fabric is saturated three times at 30-35° with a solution containing 30 g/liter I, 960 g/liter III, and a catalyst, wrung out to 90-100%, dried at 70°,

Card 1/4

- 172 -

POLAND/Chemical Technology - Chemical Products and Their Application. Dyeing and Chemical Treatment of Textiles.

Abs Jour : Ref Zhur - Khimiya, No 8, 1958, 27404

heated for 5 minutes in a current of hot air at 140° and washed, 24 hours later, in a bath containing 2 g/liter Na_2CO_3 and 0.5 g/liter Khostapon T, at 40° for 20 minutes, rinsed first with warm- and then with cold water, and dried at 70°. The following was ascertained: I fully eliminates the odor of II within a few minutes following its addition; use of I decreases only to an insignificant extent the wrinkling resistant effect; in the presence of I it is necessary to add 25-30% more catalyst for neutralization of NaOH which is liberated on interaction of I and II; the use of $Zn(NO_3)_2$ as catalyst is not recommended because of formation of precipitates; I should be added only in a slight excess over the stoichiometric amount, which is determined analytically from the content of free II in III;

Card 2/4

POLAND/Chemical Technology - Chemical Products and Their Application. Dyeing and Chemical Treatment of Textiles.

Abs Jour : Ref Zhur - Khimiya, No 8, 1958, 27404

I should be added after complete dissolution of III, and the catalyst added immediately prior to impregnation. Conditions of the manufacturing tests: III dissolved with live steam at 95°, cold water added and, at 40°, added 2 g/liter Petefobol IW, to increase hydrophobic property of the fabric, and 1 g/liter CH_3COONa (as buffer). I was dissolved separately in warm water and added to solution of III with stirring, within 15-20 minutes. Toward the end the catalyst was added to the solution which had a pH 6-7 and was then used to impregnate the fabric in a 3-bowl padder operated in conjunction with a drier, utilizing 90-100% squeezing and maintaining the temperature of the solution at 25-30°. The dried fabric was heated for 4-5 minutes at 150° in an apparatus of the "Turbofix"-type, and was washed

Card 3/4

MAJZNER, Jozef

The color chemist and his role in the textile industry. Przegl wlokien 16 no.4:192-196 Ap '62.

1. Politechnika, Lodz.

MAJZNER, J

MAJZNER, Jozef; KUCHNIEWSKI, Andrzej; JEDRUSIAK, Zenon

Crease-resistant impregnation of cotton fabrics with Eponite 136 epoxy resin with zinc sulfate and zinc perchlorate used as catalysts. Przegl wlokien 16 no.5:292-297 My '62.

MAJZNER, Jozef; BRZEZINSKI, Jerzy; JEDRUSIAK, Zenon

Use of mixed precondensate of melamine-urea-methanal resin for crease-resisting impregnation of linen. Wlokiennictwo Lodz no.9:17-32 '62.

1. Katedra Wykonczalnictwa Przedzy i Tkanin Politechnika, Lodz.

MAJZNER, Jozef, doc. mgr inz.; WAWRZYNIAK, Andrzej, mgr inz.

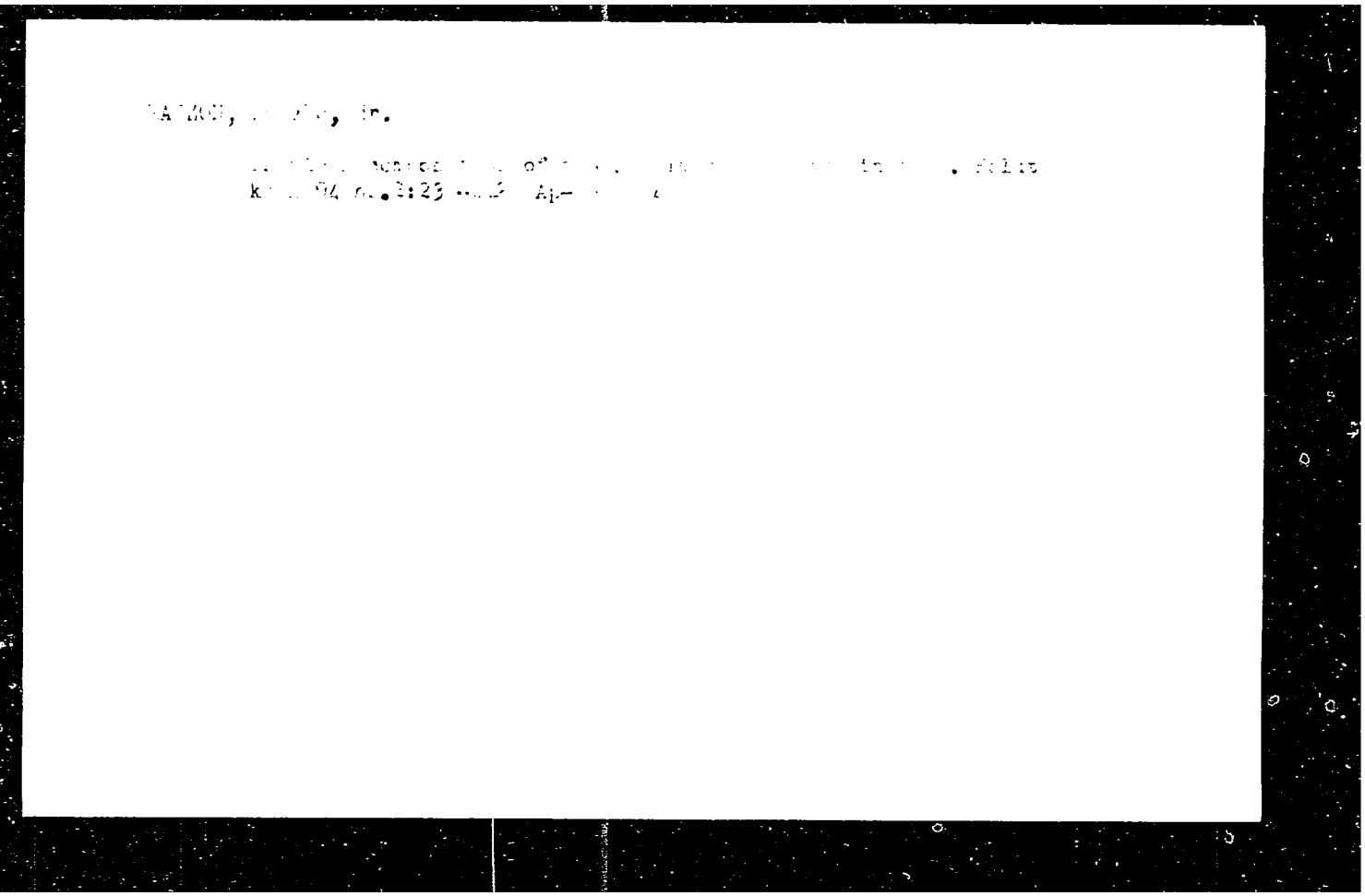
New reactive hydrophobic compounds. Przegl wlokien 17 no. 2: 103 F '63.

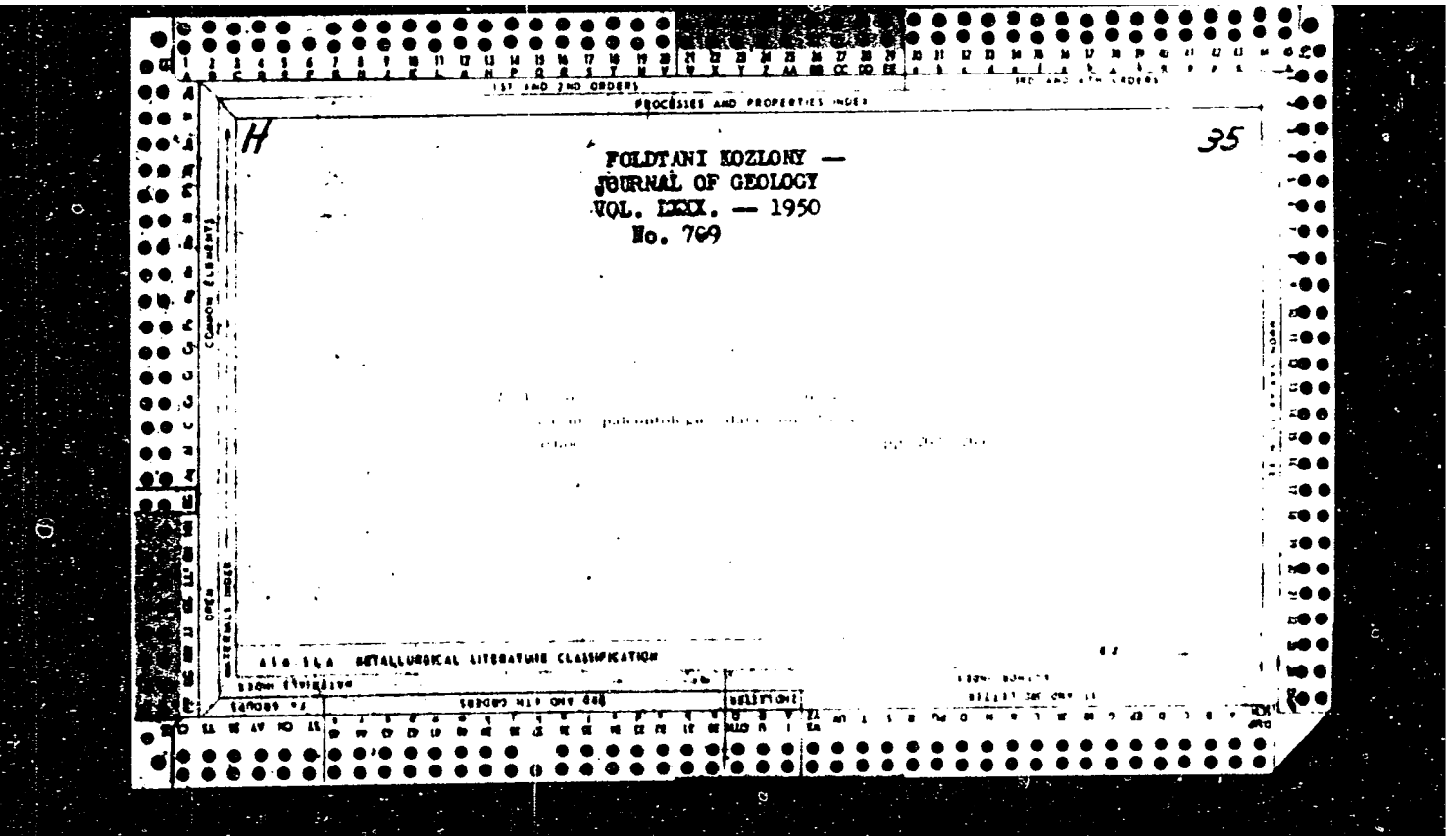
1. Katedra Wykonczalnictwa, Politechnika, Lodz.

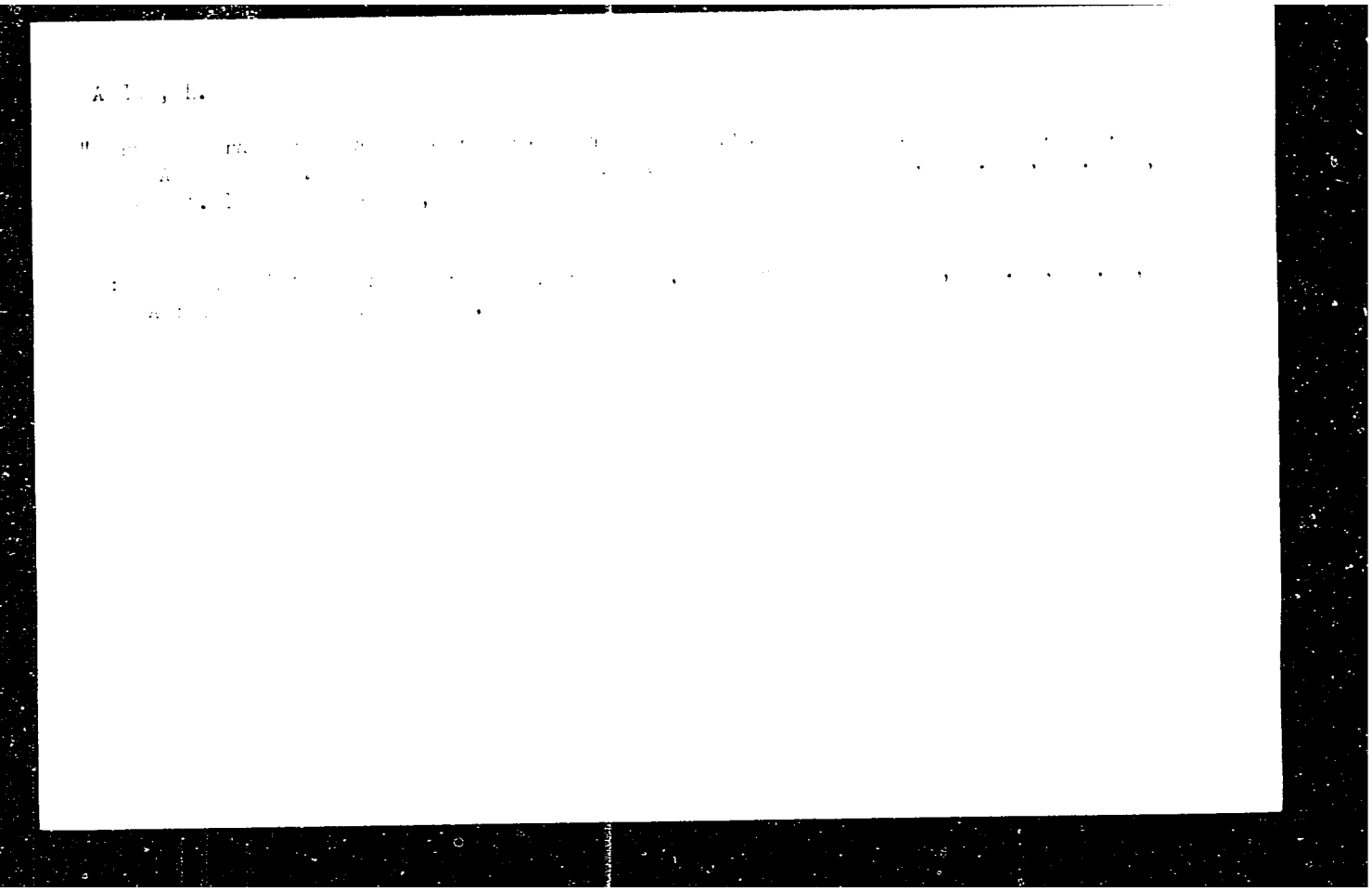
MAJZON, Laszlo, dr., a fold - es asvanytani tudomanyol doktora, fogeologus
CSIKY, Gabor, dr., geologus

Role and significance of paleontology in hydrocarbon research.
Bany lap 96 no.10:671-675 0'63.

1. Orszagos Koolaj - es Gazipari Troszt, Budapest.



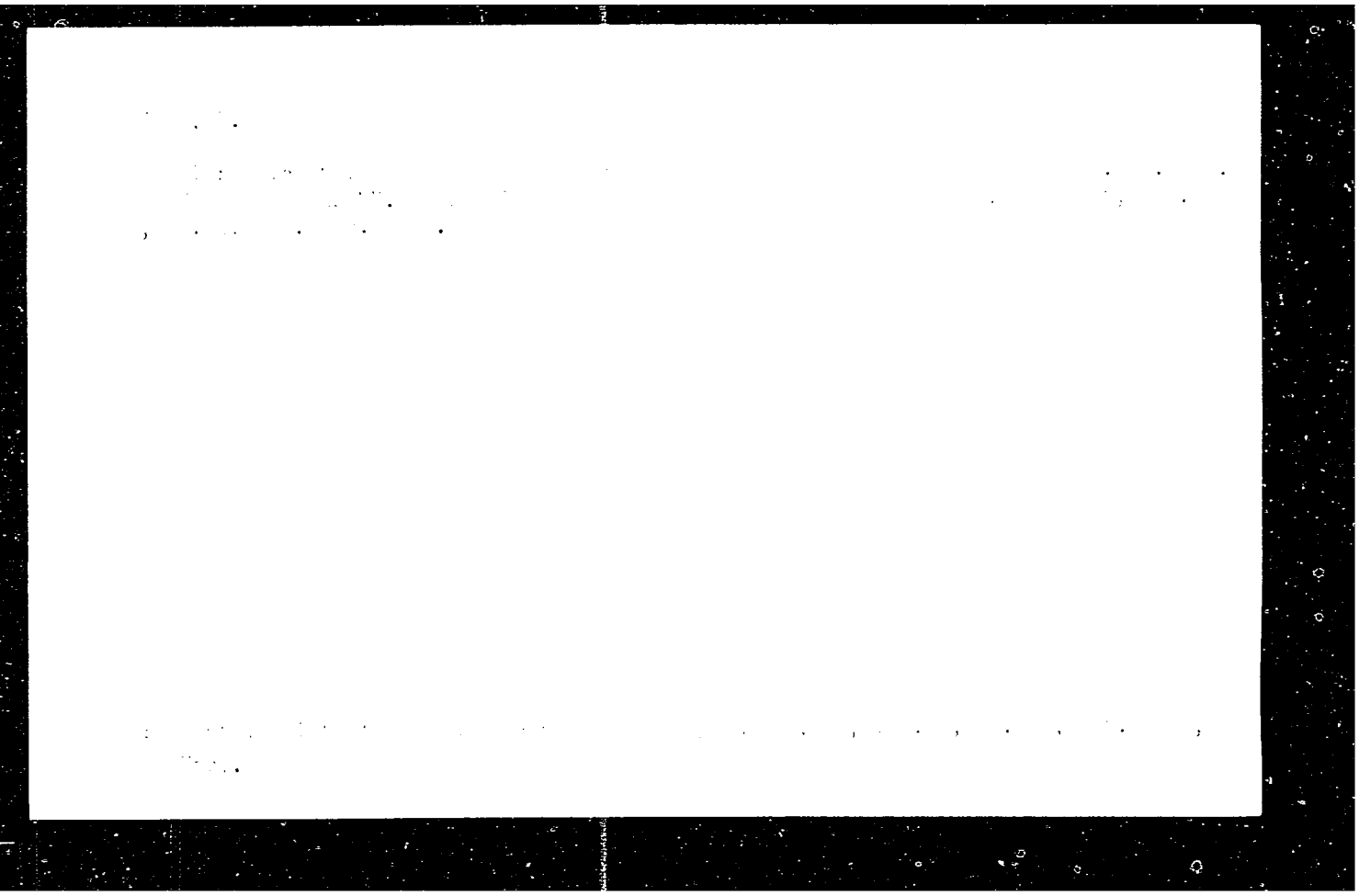




MAJZ[illegible], L.

"Cont[illegible] to the strati[illegible] of the [illegible]." [illegible]
Acta Geologica, [illegible], [illegible], [illegible], 243

SO: Eastern European [illegible] List, [illegible], Oct 1[illegible], [illegible]



APPROVED FOR RELEASE: 06/20/2000 CIA-RDP86-00513R001031420005-5"

MAJOR, I.

In the memory of Aurel Frankenau on the occasion of his fifth birthday.
In German. p.195.
(Magyar Nemzeti Muzeum Termeszettudomanyi Muzeum Evkonyve, Vol. 7, 1955,
Budapest, Hungary)

SO: Monthly List of East European Accessions (EEAI) LC, Vol. 6, no. 5, Sept. 1957, Uncl.

MAJZON, I.

New and interesting Foraminifera species. [illegible]. 1961.
(Magyar Nemzeti Muzeum Termeszettudomanyi Muzeum Evkonyve, Vol. 3, 1961,
Budapest, Hungary)

SO: Monthly List of East European Accessions (EEAI) LC, Vol. 6, No. 6, Sept. 1961, Uncl.

MAJZON, L.

FOLDTANI KOZLONY. BULLETIN OF THE HUNGARIAN GEOLOGICAL SOCIETY. (Magyar Foldtani Tarsulat) Budapest.

Age of the Sotzka fossil layers in Yugoslavia. p. 35.

Vol. 88, No. 3, July/Sept. 1958

Monthly List of East European Acessions (EEAI), LC, Vol. 8, No. 3, March 1959
Unclass.

MAJZON, Laszlo, dr.

Paleogene Foraminifera horizons in Hungary. Foldt kozl 90 no.3:355-362 Jl-S '60. (EEAI 10:2)
(Hungary--Forminifera)

MAJZON, Laszlo, dr.

The Hantkeninae of Hungary. Foldt kozl 90 no.4:428-441 O-D '60.
(EEAI 10:5)

(Hungary--Hantkenindae)

MAJZON, L.

The Palaeogene foraminifera horizons of Hungary. Acta geol Hung 7 no.3/4:405-413 '62.

1. Hungarian Petroleum Trust, Budapest.

BOGSCH, Laszlo, dr.; BALDI, Tamas, dr.; FOLDVARI, Aladar, dr.; SCHRETER, Zoltan, dr.; MAJZON, Laszlo, dr.; VADASZ, Elemer, dr.

Remarks about Dr. Ilona Csepreghy nee Meznerics' article "The question of "chattien"-Aquitanian in the light of the history of science. Foldt kozl 42 no.2:196-202 Ap-Je '62.

1. "Foldtani Kozlony" felelos szerkesztoje (for Vadasz).
2. "Foldtani Kozlony" szerkeszto bizottsagi tagja (for Bogsch and Majzon).

MAJTON, Laszlo, dr.ac.

In commemoration of Miksa Hantken. Foldt kozl 92 no.3:2[illegible]-267 J1-S '62.

1. "Foldtani Kozlony" szerkeszto bizottsagi tagja.

MAJZON, Laszlo, dr. ac.

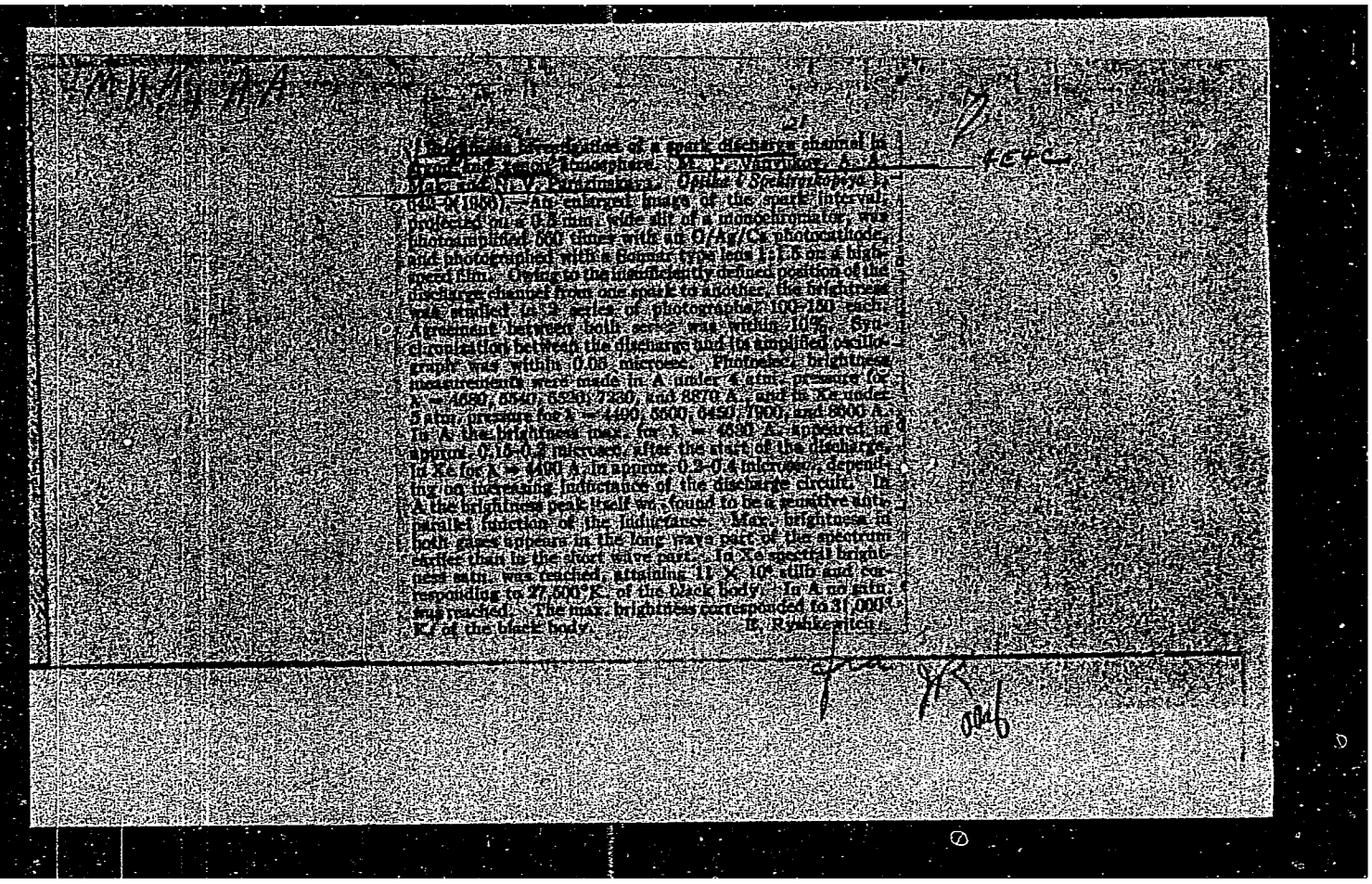
Nomenclatural modification of Miksa Hantken's work entitled "The fauna of the Clavulina Szaboi strata." Foldt kozl 92 no.3:268-273 Jl-S '62.

1. "Foldtani Kozlony" szerkeszto bizottsagi tagja.

MAJZON, L.

Stratigraphic range of planktonic foraminifera in Hungary
Acta geol Hung 8 no.1/4:283-300 '64.

1. Hungarian Petroleum Trust, Budapest.



51-4-[illegible]-17/[illegible]

AUTHORS: Vanyukov, [illegible], Mak, A. A. and Ure[illegible], [illegible]

TITLE: Instantaneous Brightness of a Spark-Discharge Channel in a Capillary. (Mgnovennaya yarkost' kanala [illegible] razryada v kapillyare.)

PERIODICAL: Optika i Spektroskopiya, 195[illegible], Vol.IV, Nr.1, pp. 90-92. (USSR)

ABSTRACT: The paper reports results of measurements of the spectral density of brightness of a spark discharge channel in capillaries filled with air at atmospheric pressure, or with xenon at 4 atm. The technique of measurement and apparatus are described in Ref.2. Capillaries filled with air were glass tubes with internal diameter of 0.25, 0.4 and 1.5 mm and an inter-electrode distance of 10 mm. Capillaries filled with xenon were quartz tubes with an internal diameter of [illegible] mm. [illegible] was [illegible] in [illegible] direction at right-angles to the

Card 1/4

Inst[illegible] [illegible] Capillary [illegible] 51-4-1-1/

capillary. [illegible] comparison, [illegible] of bri[illegible] [illegible] discharge [illegible] [illegible] curve, [illegible] [illegible] bri[illegible] [illegible] discharge [illegible] [illegible] intensity of bri[illegible] [illegible]. At constant [illegible] [illegible] channel [illegible] capillary [illegible] particularly [illegible] [illegible] diameter [illegible] [illegible] capillaries [illegible] [illegible] capillary bri[illegible] less than in [illegible] capillary). In [illegible]

Card 2/4

Instantaneous [illegible] Capillary. [illegible]

energy of discharge through a capillary increases brightness. [illegible] brightness of 50×10^6 stilb was obtained in a channel [illegible] wide, filled with [illegible] at atmospheric pressure, on discharging a 0.011 μF condenser charged to 25 kV. The brightness temperature for this case was [illegible]°K. Increase of the [illegible] [illegible] from 10 to 30 mm [illegible] [illegible] the [illegible] of brightness. Fig.2 [illegible] xenon in a 2.7 mm capillary filled with xenon [illegible] (curve 1) and for a spherical [illegible] filled with [illegible] (curve 2) [illegible] Fig.2 show that brightness

Card 3/4 in a capillary filled with xenon (7×10^6 stilb) is

Instantaneous Bri[illegible] of [illegible] Spark-Discharge [illegible] Capillary. 51-4-1-15/16

less [illegible] brightness in [illegible] lamp (11 [illegible]). [illegible] the [illegible] limited by [illegible] comparatively [illegible] of [illegible] show that radiation from [illegible] capillary [illegible] differs considerably from black-body radiation ([illegible] curves), except at high energy [illegible] discharge channel (Fig.1, [illegible] 1 and 3). [illegible] obtained are [illegible] 2 figures, 1 table [illegible]

Card 4/4

ASSOCIATION: [illegible] Institute of Optics [illegible]

SUBMITTED: [illegible]

AVAILABLE: Library of Congress

1. Capillaries-Spark discharge-Brightness 2. Capillaries-Spectral density

VANYUKOV, M.P.; MAK, A.A.

Temperature of a spark discharge channel. Dokl.AN SSSR 123 no.6:1022-1024 D '58. (MIRA 12:1)

1. Predstavleno akademikom A.A. Lebedevym.
(Electric discharges through gases)

AUTHORS: [illegible] SOV [illegible]

TITLE: [illegible] Light Sources of Great [illegible] (Impul'snyye istochniki sveta vysokoy [illegible])

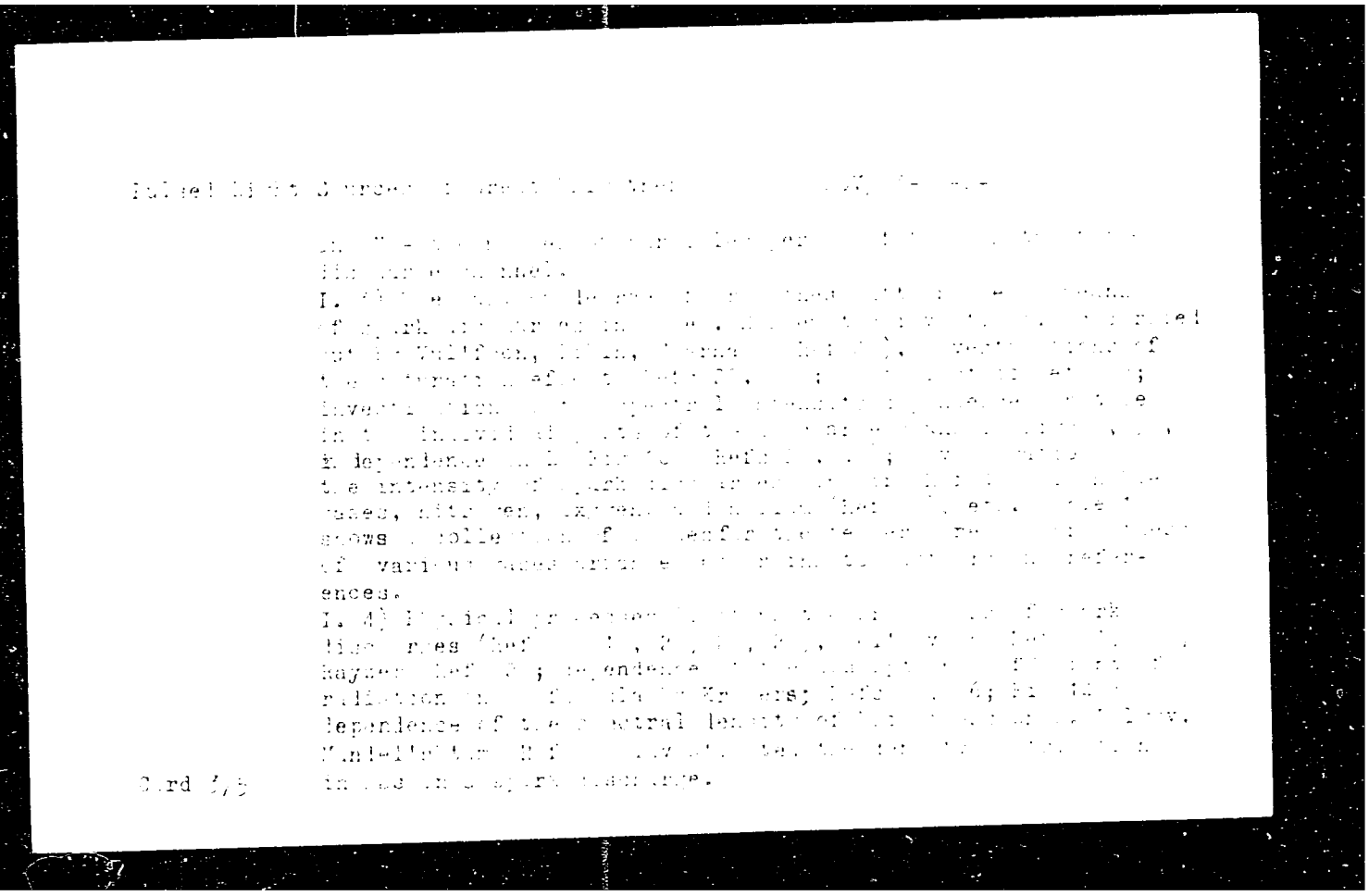
PERIODICAL: Uspekhi fizicheskikh nauk, [illegible], Nr [illegible], pp [illegible] (USSR)

ABSTRACT: The present paper is an abstract [illegible] from 10[illegible] Soviet and non-Soviet publications. It gives a concentrated survey of the present state of spark-discharge devices, their characteristics, and their theories. Chapter I.: Spark [illegible] in gases. Emission of radiation caused by the following [illegible] of electrons in the field of positive ions (free-free transition), by the recombination of electrons and ions (transition from a free to a bound state), and by transitions from bound to bound states - emission of [illegible]
[illegible].
I. 1) [illegible] of producing spark discharges of high intensity: Connection between U_0, C, L, ωt, molecular weight of the [illegible], pressure. Discussion of a pulse tube with condenser [illegible] according to Fruengel (Fruengel), Ref 11, [illegible] discharge circuit with condensers connected [illegible]

Card 1/4

(Fig 2, Ref 12); pulse tube with ceramic condensers (Fig 3) as constructed by Vanyukov, Dobretsov, Isayenko, [illegible] - [illegible] kV, 0.022 μF, 0.06 μH, to 4 kW; coaxial condenser according to Fisher (Ref 15), high-voltage toroid condenser (Ref [illegible]); discharge circuit for large pulses and small L - investigated by Komel'kov and Aratov (Ref [illegible]), construction of [illegible] different condensers [illegible] μF, [illegible] voltage [illegible] kV and L = [illegible]; maximum current in the circuit [illegible].10[illegible] A.
I.2) Methods of measuring brightness and temperatures (Refs [illegible] 22 - [illegible]). Measurement of temperature in [illegible] (Refs [illegible]) [illegible] method (Refs [illegible]; [illegible] tric method (Refs [illegible] 11, 1[illegible], 2[illegible] [illegible]); [illegible] chronograph [illegible]); [illegible] electric device for the measurement of brightness developed by Vanyukov, [illegible] (Ref [illegible], Fig [illegible]). [illegible] literature, [illegible] number of theoretical investigations was discussed [illegible] the investigation of the distribution of atoms and ionization in the channel of a spark discharge (Refs 2[illegible], [illegible], [illegible], [illegible]1, [illegible]2); investigation of the spectral distribution of radiation according to Planck's law; [illegible] and Parfenov (Ref [illegible]) calculated the [illegible] temperature in spark discharges according to the theory of the pinch effect (Ref 4[illegible]): $2NkT = I^2$, where I denotes the discharge current

Card 2/5



Card 2/3

II. Spark discharges in capillaries (Refs 1[illegible] [illegible] etc.). Wiring scheme for parallel condensers, $C = 100$ [illegible], $L = 1.$ [illegible]. Investigation [illegible] the optical properties [illegible] the [illegible] spark discharges (Refs [illegible]). [illegible] meters are shown in table [illegible]. Investigation of the connection between temperature and [illegible] (Fig. 1[illegible], Ref [illegible]); the influence exercised by the material of tube walls (Ref [illegible]).

III. Sliding spark discharges (discharges between electrodes located on the surface of dielectrics). [illegible] of flashes $10^{-6} - 10^{-7}$ [illegible] [illegible] 20 kV [illegible] wiring scheme [illegible]

IV. Electric wire explosions [illegible] interested [illegible] [illegible] temperature plasma [illegible] (Refs [illegible]) [illegible] of temperatures [illegible] [illegible] electrical [illegible] [illegible] Spark [illegible] (Ref [illegible]) [illegible] references [illegible] temperature of [illegible] [illegible]

VI. Possibilities of further increase of the [illegible] survey. Theoretically, it would be [illegible] temperatures of the order of 10^{5} K (Ref 1[illegible]). There are [illegible] figures.

Card 4/5

24(4)

AUTHOR: [illegible]

TITLE: High Temperature Surging Light Source [illegible]
Impul'snyy istochnik sveta

PERIODICAL: Doklady Akademii nauk SSSR [illegible]
("SSSR")

ABSTRACT: The present paper describes the [illegible]
cavity [illegible] water wal[illegible]
tours of a [illegible]
apparatus is shown [illegible]
of the discharge channel was determined photoelectrically.
The results were with respect to [illegible]
measurements [illegible]
pulse in [illegible]
0.7 msec, the reproducibility of the [illegible]
tion of the [illegible] were satisfactory [illegible]
Investigation [illegible]
bri[illegible]
Wit[illegible]

Card 1/4

1/3

High Temperature Surging Light Source

Card 2/4

probably [illegible] to an increase [illegible] and also to a great extent to the influence [illegible] the capillary walls. Investigation of [illegible] tion in the discharge channel [illegible] front surface onward, the brightness of the [illegible] body is the same, but in the direction vertical to the discharge axis brightness decreases towards the edge of the luminescent body. This decrease becomes less with increasing wave length, which is probably connected with the decrease of the absorption coefficient of radiation with increasing wave length. In the case of sufficiently high voltage, the introduction of an additional open spark gap does not exert any such influence on the brightness of the temperature of the discharge channel in the capillary. The author thanks P. I. Yanyukov for his constant interest in this work, for his valuable advice, as well as for discussing the results of measurements. There are 2 figures and 2 Soviet references.

Card 3/4

AUTHORS: Yanyukov, M. I., Mak, A. A.

TITLE: On the Temperature of the Channel of a Spark Discharge (O temperature kanala iskrovogo razryada)

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 6, pp 1022-1025 (USSR)

ABSTRACT: This paper discusses the results obtained by measuring the temperature of the channel of spark discharges in argon, xenon and hydrogen by determining the spectral density of channel brightness for wave lengths which correspond to the [illegible] of gravity of the lines. These measurements are carried out for various rates of entering of the energy into the discharge channel. Measuring methods were described in a previous [illegible]. The measuring apparatus is discussed in short. The [illegible] was investigated in argon for the lines 4806; 4348, and 3513 Å, in xenon for 2900 and 2600 Å. The results of the measurements are shown by 2 figures. In the investigated interval of variation of contour inductivity, the discrete radiation (lines) of argon and xenon reached practically the extreme value. Continuous radiation, however, at < 4000 Å by far does not reach

Card 1/2

saturation value. The continuous and the discrete radiation of the discharge in nitrogen (P = 2 atm) was investigated in the spectral region 4000-6000 Å. Under these conditions, brightness was saturated at wave lengths above 5500 Å for continuous irradiation and also for all the investigated lines (λ 4097; 5001; and 5045 Å). According to Planck's formula for the irradiation of an absolutely black body, the authors calculated the temperatures which correspond to the spectral densities of the brightness for these wave lengths of the discrete and of the continuous spectra for which a saturation of the brightness was observed. The strongly different temperature values for various wave lengths in the case of xenon, especially for xenon and nitrogen. According to this, the temperature of the channel of the spark discharge depends to a small extent depends on the rate of entering of the energy into this channel. The distribution of the temperature over the cross section of the channel appears to be uniform. The authors thank V. R. Muratov who assisted in carrying out the measurements. There are 1 figure and 9 references, 3 of which are Soviet.

PRESENTED: July 7, 1958, by A. A. Lebedev, Academician

SUBMITTED: June 27, 1957

Card 2/2

SOV/54-59-3-5/21

24(7)

AUTHORS: Vanyukov, M. P., Yermakov, B. A., Mak, A. A., Muratov, V. E.

TITLE: Recording of the Variation With Time of the Contours of Spectral Lines in the Radiation of a Spark Discharge

PERIODICAL: Vestnik Leningradskogo universiteta. Seriya fiziki i khimii, 1959, Nr 3, pp 25-32 (USSR)

ABSTRACT: In the present paper a three-channel photoelectric apparatus for the recording of the variations with time pulses of the discharge spectra is developed for a wide intensity interval. The scheme of the apparatus is represented in figure 1. The spectral decomposition of the periodic discharges was made by means of a monochromator according to Eberth and Fast with a plane diffraction grating for interferences of first order. The grating was constructed by F. M. Gerasimov in the GOI Laboratory. During the recording the grating slowly rotated. It was connected with an electron selfrecording potentiometer of the type EPP-C.9 over a synchronous transmitter. The angular velocity of the grating could be adjusted gradually from 60 to 12, 2.5, 0.5, and C.1 Å/min. The radio apparatus consisted of three uniform channels permitting a simultaneous recording of the spectrum at three different instants, i.e. the amplitude of

Card 1/3

the pulse obtained at the outlet of the electron trigger is proportional to the value average with respect to time Δt of the signal to be investigated for a given period of delay t_3. The pulses obtained are thus modulated according to the spectral radiation distribution of the pulse source for time t_3. These pulses arrive at a collecting scheme, subsequently at a direct-current amplifier, and finally at the selfrecording potentiometer. The three channels record in the time intervals 0.05 - 0.45 μsec, 0.4 - 20 μsec, and 0.5 - 50 μsec. For the determination of the best working conditions the time of adjustment of the collecting element was varied. By means of this device line contours and also the shift of the maxima toward 0.1 Å may be observed. The limit of the time resolving power with time is 5.10^{-8} sec. In the figures 2-7 the contours of the spectral lines of nitrogen and helium in spark discharge tubes are represented. Herefrom it may be seen that the lines widen mainly in the first stage of discharge (Fig 7) which indicates a Stark line widening. The maximum concentration of the charged particles is observed at the beginning of discharge.

Recording of the Variation With Time of the Contours of Spectral Lines in the Radiation of a Spark Discharge SOV/54-59-3-5/21

It was found from the helium line II 4686 Å that it is $\sim 10^{18}$ cm^{3}. Also the arc discharge spectra of helium could be recorded. The observed asymmetry of the lines could be explained by the direction of the line shift. There are 7 figures and 7 references, 3 of which are Soviet.

SUBMITTED: April 14, 1959

Card 3/3

05449

AUTHORS: Yermakov, B. A., and Mak, A. A.

TITLE: Use of Storage in Recording Flash Spectra [illegible] (Primeneniye metoda nakopleniya pri fotoelektricheskoy registratsii vremennykh spektrov svetovykh vspyshek)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, No. 4, pp 94-97 (USSR)

ABSTRACT: The system is illustrated by Fig. 1, in which 1 is the pulsed (repetitive) light source, 2 is the grating monochromator, 3 is the photomultiplier, 4 is the amplifier, 5 is the delay line (with a synchronizing pulse input), 6 is the gating-pulse generator, 7 and 7' are electronic gates, 8 and 8' are stores, 9 is the output stage, and 10 is a recorder. (The object of 8 and 8' is to improve the stability of the zero reading.) The second section deals with the errors of measurement and with the choice of scan rate. The third section describes the units briefly. Amplifier 4 is a normal video-amplifier with a rise time of 0.05 μsec and a gain of 100. The amplifier is linear up to [illegible] output. The gating-pulse generator uses a thyratron to [illegible] a delay line. Fig. 2 shows the differential circuit

Card 1/2

[illegible]
SOV/[illegible]

Use of Storage in Recording Flash Spectra Photoelectrically

stage, together with the gate and storer. Fig. [illegible] shows the contour of the [illegible] A line of Xe [illegible] 2·10⁻⁶ sec [illegible] the start of a discharge from [illegible] to [illegible] kV. The integrating time is 10 [illegible], with a repetition frequency of 15 cps. The [illegible] 5 x 10 [illegible] sec, the wavelength resolution is [illegible]. There are 4 figures and [illegible] references, [illegible] Soviet and [illegible] Western.

ASSOCIATION: Gosudarstvennyy [illegible]ticheskiy institut [illegible] Institute)

SUBMITTED: March 28, [illegible]

[illegible]

МАК, А.А.

66702

24(2)/20 SOV/109-4-8-22/35

AUTHORS: Granovskiy, V.L., Luk'yanov, S.Yu., Spivak, G.V. and Sirotenko, I.G.

TITLE: Report on the Second All-Union Conference on Gas Electronics

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 8, pp 1339 - 1358 (USSR)

ABSTRACT: The conference was organised by the Ac.Sc.USSR, the Ministry of Higher Education and Moscow State University.
T.B. Fogel'son - "Methods of Reducing the Energy Lost in the Formation of a Breakdown".
L.I. Pivovar and V.I. Gordiyenko - "Microdischarges and pre-Breakdown Currents Between Metal Electrodes in High Vacuum".
V.A. Simonov and G.P. Katukov - "Investigation of the Processes of Initiation and Development of a High-voltage Discharge in Vacuum".
E.N. Reykhrudel and G.V. Smirnitskaya - "The Characteristics of Ignition in High-vacuum in Magnetic Fields".
L.V. Tarasova et al. dealt with the transfer of the electrode material during the pre-breakdown stage in vacuum.
N.B. Rozanov et al. - "The Motion of Micro-particles of Substances During Electric Breakdown in Vacuum".
The third section dealt with the problems of electric sparks, corona and their practical applications. It was presided over by I.S. Stekol'nikov. The following papers were read:
V.I. Levitov et al. - "Probe Investigation of the a.c. Corona Fields".
G.N. Aleksandrov - "Elementary Processes in the Ionisation Zone of Corona-type Conductors at Atmospheric Pressures".
V.A. Burmakin - "Appearance of a Corona Discharge in Hydrogen and Nitrogen"
P.N. Chistyakov et al. - "Some Properties of the Corona Discharge in Hydrogen in Coaxial, Cylindrical System".
A.S. Sobolева and B.N. Klyarfel'd - "Appearance of Discharge Phenomena Between a Point and a Plane at Gas Pressures of 10^{-3} - 1.0 mm Hg".
Ya.Yu. Reymet et al. - "Methods of Unipolar Ionisation of Air By Means of Aero-Ionisers (see p 1335 of the Journal).
M.P. Vanyukov et al. - "Time Spectra of the Radiation of a Spark Discharge in Inert Gases" (see p 1284 of the journal).
M.P. Vanyukov and A.A. Mak - "Production of High Temperatures by Means of Spark Discharges".
V.A. Peretyagin - "Influence of the Magnetic Field of the Electric Discharge on the Dividing Surface of Two Media".
I.S. Stekol'nikov - "New Data From the Study of Long Sparks".
M.I. Syrkov - "Properties of the Breakdown of Compressed Air in a Comparatively Uniform Field in the Presence of Localised Non-uniformities".
A.A. Vorob'yev et al. - "Pulse and Oscillographic Techniques for the Measurement of the Discharge Lags in Dielectrics" (see p 1257 of the journal).
A paper by B.N. Zolotykh dealt with the problem of the basic theory of the electric erosion (see p 1330 of the journal).
The fourth section was presided over by S.Yu. Luk'yanov and was concerned with the non-stationary and low-frequency discharges. The followin papers were read:
I.G. Nakrashevich and A.A. Labud - "The Nature of the Current Interruption During the Electric Explosion of a Metal Wire".
V.A. Simonov - "Propagation of Plasma From Local Pulse Sources".

Card 7/15

G.G. Timofeyev et al. - "Observation of an Electro-dynamically Compressed Arc By Means of an Electron-optical Converter".
M.S. Ioffe and Ye.Ya. Yushmanov - "Investigation of the Radial Electric Field in an I[illegible] Magnetron".
V.A. Belyayev and M.A. R[illegible] - "Experiments with an Electron Model of a Syste[illegible] Magnetic Samples".
A.M. Andrianov et al. "D[illegible] Magnetic and Electric Fields in Powerful Pulse D[illegible]".
G.N. Harding (England) - "S[illegible] Determination of the Plasma Temperature in [illegible] "Zeta" Equipment" (see p 1326 of the journal).
The paper by Harding ar[illegible] interest and Academician L.A. Arts[illegible] the opinion that the electrons [illegible] the "Zeta" should be of the [illegible] to Harding, the elect[illegible] an [illegible]

SOV/109-4-8-10/35

AUTHORS: Vanyukov, M.P., Mak, A.A. and Muratov, V.R.

TITLE: Time Spectra of the Radiation of Spark Discharges in Inert Gases

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 8, pp 1284 - 1285 (USSR)

ABSTRACT: Some data relating to the time spectra of the light pulses in the spectrum bandwidth, ranging from 2 500 - 12 000 Å, were recorded by means of the equipment devised by the authors (Ref 1). A detailed description of the equipment was given in Ref 2. The time resolution of the device was 5×10^{-8} sec. The spark discharges investigated were produced between spherical electrodes in tubes filled with argon, krypton or xenon; the pressure of the gas was 3.5 atm. and the inter-electrode distance was 10 mm. The voltages applied to the tube were from 5 - 12 kV, the storage capacitance was 0.01 to 0.05 μF and the circuit inductance was 0.1 to 12 μH. It was found that the radiation of the discharge consists of a continuous background and a number of broadened lines, many of which can be identified with the lines of single- and

Card1/2

Time Spectra of the Radiation of Spark Discharges in Inert Gases

double-ionised gas atoms. If the storage condenser is decreased, the line in the vicinity of λ = 3 000 Å is intensified. The lines of the double-ionised atoms appear during the initial stage of the discharge and are rapidly attenuated with time; the single-ionised atoms appear somewhat later and their attenuation is slower. There are 3 Soviet references.

SUBMITTED: March 5, 1959

Card 2/2

...ov/51-6-1-3/30

AUTHORS: Vanyukov, M.P., Mak, A.A., and Muratov, V.K.

TITLE: Time Spectra of Emission by Spark Discharges in Inert Gases (Vremennyye spektry izlucheniya iskrovogo razryada v inertnykh gazakh)

PERIODICAL: Optika i Spektroskopiya, 1959, Vol 6, Nr 1, pp 17-23 (USSR)

ABSTRACT: The present paper describes time spectra of the intensity of emission by spherical pulse-discharge lamps filled with argon, xenon and krypton at 3.5 atm. The author studied the emission in the 2500-5500 Å region obtainable using various combinations of capacitance and inductance in the discharging circuit. The time spectra were obtained with photoelectric apparatus, whose resolving power was about 5×10^{-8} sec, developed earlier and described in Ref 2. An Ebert--Fasti monochromator, with a mirror objective of 320 mm diameter and a diffraction grating with 600 lines/mm, was used. The relative spectral sensitivity of the apparatus was measured using a standard incandescent lamp (Ref 3). The absolute (energy) scale for the intensity of emission was obtained at 4140 Å by using an incandescent lamp whose spectral energy density was known for that wavelength. The spectral slit-widths used were from 2 to 20 Å. The instantaneous values of the emission intensity of pulse-discharge lamps were measured

Card 1/3

at various times t, counted from the beginning of the discharge. The first record was always obtained (with the exception of curve 1 in Fig 6) at the moment of the maximum intensity of emission. The results of measurements are given in Figs 1-9 in the form of two or three energy spectra obtained at various times. The results for argon are given in Figs 1 and 2, for krypton - in Figs 3-5, and for xenon - in Figs 6-9. The results of these figures show that increase of inductance in the discharge circuit reduces the intensity of continuous radiation and consequently the line emission becomes clearer. It was found that in the process of a spark discharge a continuous spectrum and lines of doubly ionized atoms appear first. Later the intensity of the doubly ionized lines decreases and instead the lines due to singly ionized atoms appear in the spectrum. The latter lines decay more slowly than the continuous background. The spectral distribution

Time Spectra of Emission by Spark Discharges in Inert Gases

of the continuous background differs greatly from that expected of a black body and was found to be only slightly dependent on the wavelength. This effect may be due to non-uniformity of the temperature distribution in various parts of the discharge channel and possibly also due to differences in the absorption coefficient of the discharge plasma in various spectral regions. There are 9 figures and [illegible] Soviet references.

SUBMITTED: [illegible]

Card 3/3

VANYUKOV, M.P.; MAK, A.A.

Brightness of some pulse light sources. Usp.nauch.fot. 6:31-34 '59.
(MIRA 13:6)

(Electric discharge lighting)

VANYUKOV, M.P.; DOBRETSOV, A.F.; ISAYENKO, V.I.; MAK, A.A.

Powerful pulse light source. Usp.nauch.fot. 6:53-57 '59.
(MIRA 13:6)

(Electric discharge lighting)
(Photography, Flashlight)

VANYUKOV, M.P.; YERMAKOV, B.A.; [illegible], A.A.; MURATOV, V.R.

Record of the time variations of spectral line contours in the emission from a spark discharge. Vest.LGU 14 no.16:25-32 '59. (MIRA 12:10)

(Spectrum analysis)

24 (7), 24 (8)

AUTHORS: Vanyukov, M. P., Mak, A. A. SOV/[illegible]

TITLE: Maintenance of High Temperatures by Means of a Spark Discharge

PERIODICAL: Izvestiya Akademii nauk SSSR. Seriya fizicheskaya [illegible]
Vol 23, Nr 8, pp 962 - 964 (USSR)

ABSTRACT: In connection with the development of light sources of high brightness, it is of great interest to find out how a maximum temperature within the spark channel may be maintained and to obtain a picture of the temperature distribution in the mentioned channel. In the present paper the results of an investigation of the temperature within the spark channel obtained by measuring the spectral intensity of the brightness are described. The methods of measurements were previously described in another paper by the authors (Ref 1). The investigated lines of argon, xenon, and nitrogen are given. The dependence of the maximum spectral intensity of argon on the conductivity of the discharge circuit for 8 different wave lengths is given in the diagram of figure 1 and similar diagrams for the other gases investigated were elaborated (Ref 2). From these data the temperature was computed by means of Planck's formula and the results are summarized in the diagram of

Card 1/2

figure 2. It may be seen from the results that the temperature within the channel is constant in a considerable [illegible] energy source and that the limits of this period of [illegible] be determined. The absence of a temperature gradient [illegible] the spark channel, previously detected by [illegible] S. L. Mandel'shtam (Ref 9) is mentioned in the further discussion of the results. There are 2 figures and 9 [illegible] erences.

Mak, A.A. VANYUKOV, M. P.

Investigation of Spark Discharge Channel Brightness in Var[illegible] Gases.

report submitted for: The 5th International High Speed Photography Congress, Washington, D. C. 16-20 Oct., 1960.

MAK, A. A. Cand Phys-Math Sci -- (diss) "Investigation of the emission of an intensive spark discharge," Leningrad, 1960, 10 pp, 150 cop. (Leningrad State U im Zhdanov) (KL, 44-60, 128)

68902

24.3400
9.3150

S/051/60/008/02/033/036
E201/E391

AUTHOR: Mak, A.A.

TITLE: Temperature of a Spark Discharge Channel in Air

PERIODICAL: Optika i spektroskopiya, 1960, Vol 8, Nr 2, pp 278 - 279 (USSR)

ABSTRACT: The author and Vanyukov (Refs 1, 2) examined the published data and suggested that the temperature of a spark discharge channel depends weakly on the rate of supply of energy into the spark gap. The present paper reports studies of dependence of the spark-channel temperature in air on the rate of rise of the current. The discharge had the followin parameters: $C = 0.05$ μF; $U = 3$-8 kV; $L = 4 \times 10^{-9} - 5.4 \times 10^{-5}$ H ; discharge gap length was 5 mm at $L > 4 \times 10^{-9}$ H and 1.5 mm at $L = 4 \times 10^{-9}$ H . At low rates of current rise ($U/L \leq 2 \times 10^{9}$ A/sec) the spark-channel temperature was determined by measuring the ratio of the intensities of the N II lines at 5535, 549[illegible] and 5045 Å. These intensities were measured with

Card1/4

Temperature of a Spark Discharge Channel in Air

photoelectric apparatus whose maximum time resolution was 5×10^{-8} sec (Ref 3). At higher rates of current rise the temperature was deduced from the spectral density of the spark channel brightness at a wavelength representing the centre of gravity of the NII line at 5001 Å. The absorptive power of the channel at this wavelength was assumed to be equal to 1 at current-rise rates $U/L \geq 10^{11}$ A/sec, since it was found that the peak of this line was flattened out in the initial stages of the discharge, even when $U/L = 10^{11}$ A/sec (cf. figure on p 278). The following results were obtained:

U/L (A/sec)	T (°K)
1.3×10^8	2.9×10^4
3.2×10^8	2.9×10^4
6.8×10^8	3.0×10^4
2×10^9	2.6×10^4

68902
S/051/60/008/02/033/036
E201/E391

Temperature of a Spark Discharge Channel in Air

U/l (A/sec)	T (^{o}K)
7.5×10^{11}	3.1×10^{4}
9×10^{11}	3.3×10^{4} .

At $U/l = 9 \times 10^{11}$ A/sec the spectral density of the background brightness showed that the discharge channel behaves as a black body in the visible region and this temperature is T = 33 000 ^{o}K. The temperatures given in the above table are means of several measurements of the maximum temperature. The scatter of the temperature lies within the limits of the experimental error of ~ 30-35%. The results obtained show that the channel temperature is practically independent of the rate of current rise. This is confirmed by the recent results of Sukhodrev and Mandel'shtam on variations of the temperature of electrode vapours in a spark discharge (Ref 5). Temperature of an air spark (~ 30 000 ^{o}K) are lower than those of a spark

Card 3/4

Temperature of a Spark Discharge Channel in Air

in nitrogen (43 000 °K) reported by Vanyukov and Mak (Ref 2). This is due to the cooling effect of oxygen whose ionization and dissociation energies are lower than those of nitrogen (cf. Ref 1). Acknowledgment is made to M.P. Vanyukov for his advice. There are 1 figure, 1 table and 5 Soviet references.
Note: this is a complete translation apart from the figure and the references.

SUBMITTED: July 25, 1959

69271
S/051/60/008/04/002/032
E201/E691

9 3150

AUTHORS: Vanyukov, M.P., Mak, A.A. and Muratov, V.R.

TITLE: An Investigation of Spark Discharges in Helium

PERIODICAL: Optika i spektroskopiya, 1960, Vol 8, Nr 4, pp 439-445 (USSR)

ABSTRACT: The authors studied the time dependence of the arc and spark line contours emitted by a spark discharge in helium. The discharge was produced by 2.5-10 kV pulses from a 0.05 μF capacitor (the inductance, L, of the discharge circuit was 0.18 or 3.6 or 25 μH). The sparks passed through a discharge tube filled with helium of industrial purity at a pressure of 2.5-12 atm. Emission was recorded in the wavelength region 2500-5500 Å. A Geisler discharge tube was used to produce a calibration spectrum. It was found that in the initial stages of the discharges a strong continuous background was emitted, superimposed on which there were two intense spark (He II) lines at 4686 and 3203 Å (Figs 1 and 2). Arc lines of helium (He I at 3188, 3889, 4470, 4471 and 5016 Å, cf. Figs 3-5) appear later, about 0.3-0.5 μsec from the beginning of the discharge. Both the spark and the arc lines emitted by these discharges were strongly broadened and displaced due to the Stark effect. The asymmetry of the arc lines was due to their

Card 1/2

An Investigation of Spark Discharges in Helium

"statistical wings" emitted by ions. The electron concentrations, N, in the spark discharge channel were derived from the half-widths and shifts of the He I lines at 3889 and 5016 Å (Table 2) and were compared (Table 3) with the values obtained by Mak (Ref 8), who studied the contour of the spark line at 4686 Å. The various values of N agreed better with each other when corrections suggested by Vaynshteyn and Sobel'man (Refs 15) were taken into account. However, even when these corrections were included the values of N ($\sim 10^{-17} cm^{-3}$) differed by 200-300%. There are 5 figures, 3 tables and 15 references, 7 of which are Soviet, 3 English, 3 German, 1 Swedish and 1 translation.

SUBMITTED: July 24, 1959

S/020/60/[illegible]
B[illegible]/B[illegible]

26.2313

AUTHORS: Vanyukov, M P , Mak, A. A , and Sadykova, A I

TITLE: The Maximum Brightness of a Spark Discharge Channel

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol 135, No [illegible], [illegible]

TEXT: The authors investigated the maximum brightness of a spark discharge channel in argon, nitrogen, air, and helium at extreme high current surges ($U/L \geq 10^{12}$ a/sec). The high-pressure chamber used for these tests was developed by V. R Muratov. The light was obtained through a special window. The discharge circuit consisted of the following parameters: C = 0.1 - 1.0 microfarad, L = 1 - 4 henry, and U = 2 - 10 kv. The discharge gap was 1.5 mm. In the range from 4[illegible] - 6[illegible] A the continuous background was studied, also the lines He II with 4686 A, Ar II with 4348 A, N III with 4097 A, and N II with 3[illegible]4 A. The results show that the maximum brightness depends on producing an opacity of the discharge channel. With an increasing current surge the opacity will first appear in the red part of the spectrum and shift over to the blue part as the

Card 1/2

9603

The Maximum Brightness of a Spark Discharge [illegible]
Channel

surge increases. With the above mentioned parameters of the current circuit opacity is easily obtained in heavy gases. The authors mention the relation between atomic weight and pressure of the gas which will produce a maximum brightness. The theoretical results agree very well with those found experimentally. There are 3 figures, 1 table, and 9 references: 6 Soviet, 1 German, and 2 US

PRESENTED: May 25, 1960, by A. A. Lebedev, Academician

SUBMITTED: May 20, 1960

Card 2/2

9.3150 (1049, 1140, 1532)
26.2311

S/057/61/031/001/014/017
B104/B204

AUTHOR: Mak, A. A

TITLE: Measurement of electron concentration according to the intensity of the continuous spectrum of the plasma of a spark discharge

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 1, 1961, 94-99

TEXT: In the introduction, some methods for determining the concentration of charged particles in a plasma channel are discussed, and the results of several papers at presented. Next, the intensity of the continuous spectrum of a helium plasma is dealt with, and for the intensity of the bremsstrahlung of a plasma in the visible range of the spectrum at moderate temperatures, the expression

$$I_\nu = 6.36\cdot10^{-47} N_e T^{-1/2} \exp(h\nu/T) \sum_i Z_i^2 N_i \qquad (2)$$

is given. I_ν is the energy radiated per cm^3 of plasma, N_e and N_i are the electron and ion concentrations, respectively; T is the temperature; and Z_i is the ion

Card 1/ 6

discharge. The intensity which is generated by transition to levels with the quantum number n at $T > 6$ ev, where the helium is practically completely ionized, may be calculated from the expression $I_\nu = 2.77 \cdot 10^{-57} Z^4 N_e N_i T^{-1/2} n^{-3} \exp\{h(\nu_n - \nu)/T\}$ (3). With $T < 6$ ev, the helium is incompletely ionized. Here, intensity may be calculated from $I_\nu = 6.36 \cdot 10^{-47} Z_{eff}^2 N_e N_i T^{-1/2} (1 - \exp(-\Delta E/T)) \exp\{h(\nu_n - \nu)/T\}$ (4). ΔE is the decrease of ionization energy caused by microfields in the plasma. In the experiments carried out by the author, the latter used two kinds of helium of different degrees of purity. The first kind was of 95% purity, the second of 99%. The emission of H could be neglected, while that of O, C, and N was taken into consideration by means of a formula by Kramers-Unsöld. For calculating the intensity of the continuous spectrum by means of the above formulas, the equilibrium ionization of the gas at a temperature of T=2.6 - 17 ev and at electron concentrations of $N_e = 2 \cdot 10^{16}$ cm^{-3} and $2 \cdot 10^{19}$ cm^{-3} was calculated. As may be seen from the

calculated results shown in Fig. 1, the intensity of the continuous spectrum only slightly depends on temperature at $T > 5$-6 ev, and therefore an exact knowledge of the plasma temperature is not necessary for determining the electron concentration of a plasma whose temperature is within the range of 5-20 ev. As shown by experimental results, the radiation intensity of the discharge plasma only slightly depends on the wavelength. When calculating electron concentration, it was assumed that the temperature in the discharge channel was 5 ev. The electron concentration may then be calculated from the relation

$$N_e = 1.3 \cdot 10^{20} \sqrt{I_\nu} \text{ cm}^{-3} \quad (7),$$

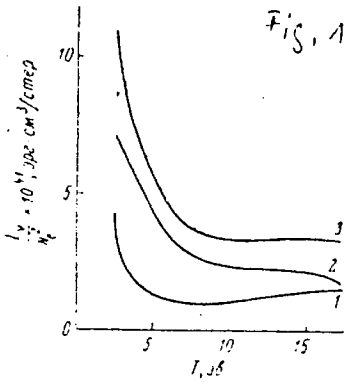
Results are given in Table 1, which shows that between the concentrations determined from the continuous background and those calculated according to the broadening of the H II 4686 A line there exists an exceedingly great difference. One of the causes for this is, according to the author's opinion, the fact that the theory of line broadening and shifting is not applicable to dense plasma. This is not changed, by considering the fact that the plasma is not perfect. A possible cause for this great deviation is the uneven electron distribution in the discharge channel. Calculation

Measurement of electron concentration . . . S/057/61/031/005/014/017
B104/B204

of temperature in the plasma channel by means of the equation of state for the plasma and the known hydrodynamic relation $p \approx \rho_0 v^2$, where ρ_0 is the initial density of the gas, gave 1.2 and 1.8 ev, for the two above-mentioned electron concentrations. In accordance with the hydrodynamic theory of the development of a spark channel, the electron concentration may be described by $N_e \sim (\rho_0 U/L)^{2/3} T$ (8). From this relation it may be seen that, in discharges occurring in gases heavier than helium, the plasma has a greater density. The gas composition was analyzed by O. P. Bochkova of LGU (Leningrad State University), who is thanked by the author. Moreover, he thanks V. I. Isayenko for photographic work, A. I. Saikov for taking part in measurements, and M. P. Vanyukov for valuable advice and help. There are 5 figures, 1 table, and 15 references: 8 Soviet-bloc and 2 non-Soviet-bloc.

SUBMITTED: May 5, 1960

Card 4/6



Legend to Fig. 1:
Temperature dependence of the intensity of the continuous spectrum of the plasma. Curve 1: emission of impurities; curve 2: emission of helium; curve 3: total emission of plasma.

Card 5/6

Measurement of electron concentration... S/057/61/031/001/014/017
B104/B104

Legend to Table 1:
1) Discharge conditions;
p_o - pressure in atm;
U - voltage in kv;
L - inductivity in microhenries;
2) Time of measurement in microseconds. 3) Electron concentration calculated from the intensity of the background. 4) Electron concentration calculated from the shift of the He II 4686-A-line.

1 Режим разряда			2	Концентрация электронов $N_e \cdot 10^{-16}$, $см^{-3}$	
p_o, ат.	U, кв.	L, мкгн	t, мксек.	по интенсивности фона 3	по сдвигу линии He II 4686 Å 4
15	9	0.18	0.1	10	2.9
			0.2	5.7	1.7
			0.3	4.1	—
15	9	0.5	0.2	4.7	2.5
			0.3	3.4	—
15	9	1.0	0.2	4.3	1.2
			0.3	3.2	—
4	2	0.18	0.1	2.9	0.7
			0.2	1.6	—
			0.3	1.2	—

Card 6/6

S/051/62/012/006/014/020
E039/E420

AUTHORS: Anan'yev, Yu.A., Mak, A.A.

TITLE: Limiting sensitivity of methods for recording time-resolved emission spectra

PERIODICAL: Optika i spektroskopiya, v.12, no.6, 1962, 779-784

TEXT: A comparison is carried out between photo-electric and photographic (with and without electronic amplification) methods of recording from the point of view that accuracy of measurement will ultimately be limited by random fluctuations. It is implied that with photoelectric recording a monochromator will be used and for photographic recording a spectrograph, and that the intensity of radiation from the source should be uniform over a spectral range equal to the width of the apparatus function. It is shown that, in general, the following relation exists between the standard deviation in errors of measurement α in spectral $\Delta\lambda$ and in time Δt resolution and the number of stored signals n

$$\alpha^2(\Delta\lambda)^2\Delta tn = \varphi$$

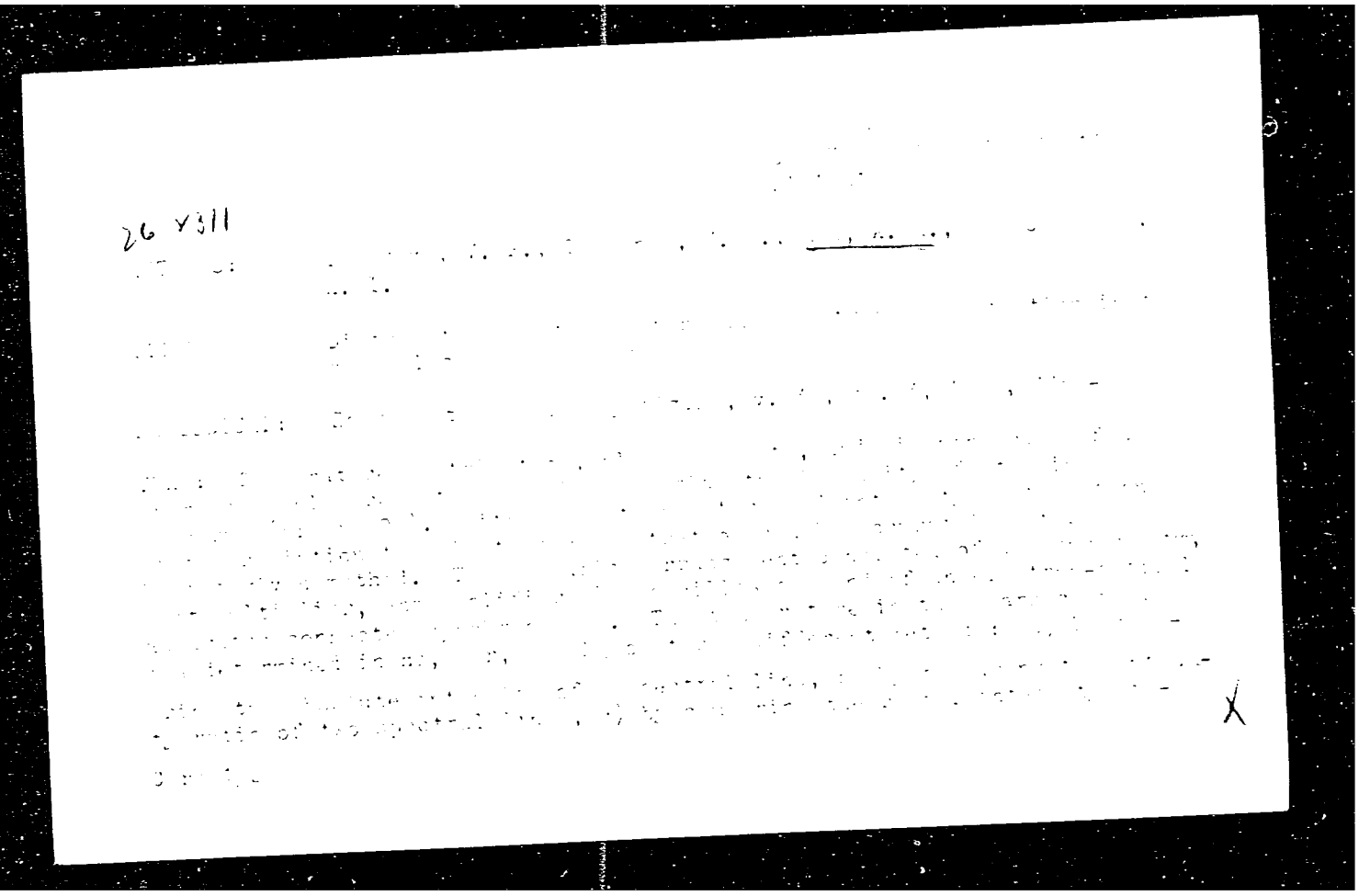
where φ is some function of the light source and recording

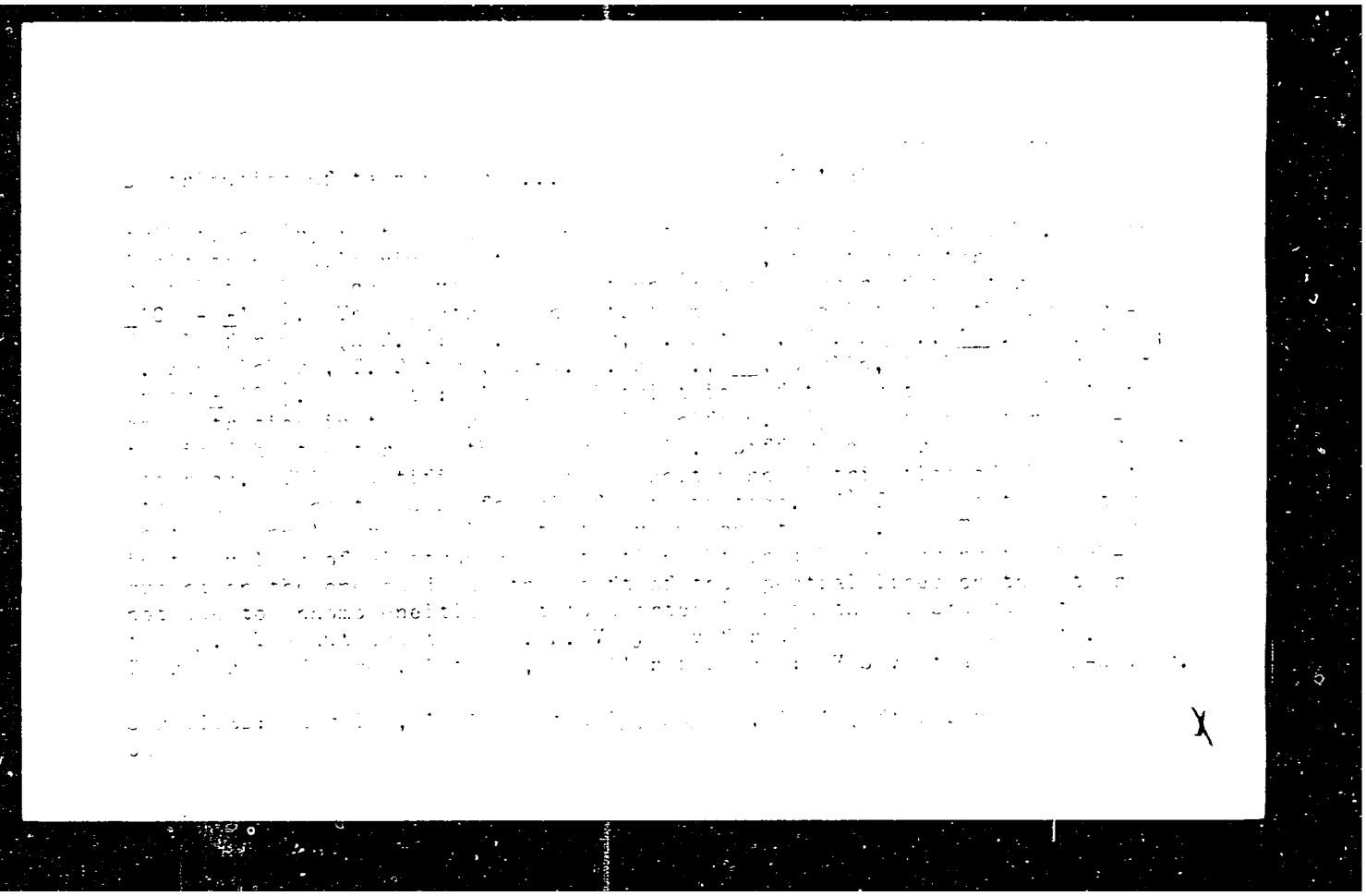
Card 1/2

S/051/62/012/006/014/020
E039/E420

apparatus. The limiting sensitivity of the photo-electric method is estimated to be at least two orders of magnitude higher than for the photographic method. However, the photographic method has the advantage of permitting the simultaneous recording of quantitative information over a wide spectral (or time) interval. It is also shown that the use of an electron-optical converter will increase the sensitivity of the photographic method by approximately two orders of magnitude. The limitations of this method are discussed. There is 1 figure.

SUBMITTED: April 19, 1961





L 10728-63 EWA(k)/EWT(1)/FBD/T-2/3W2/EEC(b)-2/ES(t)-2/BDS AFFTC/ASD/ESD-3/RADC/APGC/AFWL PL-4/Po-4 JHB/WG/IJP(C)/K/EH

ACCESSION NR: AP3003116 S/0056/63/044/006/1884/1888 82 81

AUTHOR: Anan'yev, Yu. A.; Yegorova, V. F.; Mak, A. A.; Prilezhayev, D.S.; Sedov, B. M.

TITLE: On the operation of a four-level laser 25

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 1884-1888

TOPIC TAGS: four-level laser, trivalent uranium laser, divalent samarium laser, calcium fluoride laser

ABSTRACT: A theoretical and experimental study of the operation of a four-level laser has been conducted. Equations were derived for steady-state operation, cavity parameters, properties of working substances and host substances, pumping power, threshhold, energy-level populations, various transition probabilities, and output power. To verify the theoretical calculations, experiments were conducted to determine the dependence of pumping power and output power

Card 1/2

L 10728-63

ACCESSION NR: AP3003116

of samarium-doped and uranium-doped calcium fluoride lasers on crystal temperature and reflection factor of the mirrors and to determine the relationship between pumping power and output power. Cylindrical crystals with dielectric-coated end faces were used with temperatures ranging from 8 to 300K. Experimental results were in good agreement with the theoretical. Conditions for the transition from four-level to three-level operation were found for the uranium-doped calcium fluoride laser. Orig. art. has: 10 formulas and 4 figures.

ASSOCIATION: Gosudarstvenny*y opticheskiy institut im. S. I. Vavilova (State Institute of Optics)

SUBMITTED: 21Feb63 DATE ACQ: 23Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 001 OTHER: 002

Card 2/2

L 10333-63 EWA(k)/EWT(l)/FBD/BDS/T-2/3W2/EEC(b)-2/ES(t)-2--AFFTC/ASD/ESD-3/RADC/APGC/AFWL--JHB/WG/K/EH/IJP(C)

ACCESSION NR: AP3000740 S/0020/63/150/003/0507/0510

AUTHOR: Anan'yev, Yu. A.; Gribkovskiy, V. P.; Mak, A. A.; Stepanov, B. I. (Academician AN BSSR)

TITLE: Properties of the four-level optical quantum generator 75 74

SOURCE: AN SSSR. Doklady*, v. 150, no. 3, 1963, 507-510

TOPIC TAGS: laser theory, four-level laser

ABSTRACT: A theoretical study of the behavior of a four-level laser with level 3 metastable has been conducted. It was assumed that there were no thermal transitions upward other than that from level 1 to level 2. Formulas showing the effect of working-substance parameters and cavity characteristics on the absorption and oscillation processes were derived. It is shown that in the absence of external losses a low threshold can be attained with high h Nu sub 21/kT values. With transition probabilities p sup 0 sub 32 close to p sup 0 sub 21 in value, the four-level system loses its advantages. Power output per unit resonator volume and the maximum power output of an ideal four-level laser are calculated. With low external losses and very

Card 1/2

L 10333-63
ACCESSION NR: AP3000740

low operating temperatures, the efficiency of the ideal four-level laser is very high. A formula is obtained relating power output to superthreshold pumping power. After the threshold is reached, large Nu sub 32 radiation densities are established within the cavity, changing the population of levels and thereby varying absorption power and other optical properties of the working substance. These changes can be calculated by means of the derived formulas. Orig. art. has: 1 figure and 24 formulas.

ASSOCIATION: Institut fiziki Akademii nauk BSSR (Institute of Physics, Academy of Sciences BSSR)

SUBMITTED: 29Dec62 DATE ACQ: 21Jun63 ENCL: 00

SUB CODE: 00 NO REF SOV: 004 OTHER: 000

mcs/ls
Card 2/2

L 11056-66 EWT(l)/EWT(m)/EWP(t)/EWP(b) IJP(c) JD/WW/GG

ACC NR: AT6001393 SOURCE CODE: UR/3180/64/009/000/0115/0115

AUTHOR: Vanyukov, M. P. (Candidate of physico-mathematical sciences); Mak, A. A.

ORG: none

TITLE: Study of pulsed light sources of limiting brightness

SOURCE: AN SSSR. Komissiya po nauchnoy fotografii i kinematografii. Uspekhi nauchnoy fotografii, v. 9, 1964. Vysokoskorostnaya fotografiya i kinematografiya (High-speed photography and cinematography), 115

TOPIC TAGS: light source, gas discharge spectroscopy, helium, nitrogen, argon, optic brightness

ABSTRACT: In order to determine the limiting brightnesses of pulsed light sources, the brightness of the spark discharge channel was studied in an atmosphere of helium, argon, nitrogen, and air at high rates of current buildup in the discharge. To this end, a discharge circuit based on a low-induction cylindrical capacitor was developed. Measurements of the spectral density of the discharge channel brightness were based on the continuous and line emission in the 4000-9000 Å range. In all gases studied, the limiting brightness was successfully obtained. It was found that under limiting conditions the discharge channel is opaque and radiates like an absolute black body with a temperature equal to that of the channel. Orig. art. has: 1 table

SUB CODE: 20, 07/ SUBM DATE: 00/ ORIG REF: 002/ OTH REF: 000

Card 1/1 HW

L 10066-66 EWT(1)/EWA(m)-2

ACC NR: AT6001396 SOURCE CODE: UR/3180/64/009/000/0131/0137

AUTHOR: Vanyukov, M. P. (Candidate of physico-mathematical sciences); Galaktionova, N. M.; Mak, A. A.

84
82
B+1

ORG: none

TITLE: Radiation of pulsed light sources in the ultraviolet

SOURCE: AN SSSR. Komissiya po nauchnoy fotografii i kinematografii. Uspekhi nauchnoy fotografii, v. 9, 1964. Vysokoskorostnaya fotografiya i kinematografiya (high-speed photography and cinematography), 131-137

TOPIC TAGS: emission spectrum, gas discharge spectroscopy, xenon, neon, nitrogen, argon, helium, light pulse, optic brightness

ABSTRACT: The emission spectra of strong spark discharges in xenon, argon, neon, and air in the visible and ultraviolet range (2200-5500 Å) were studied. In the case of xenon and argon (gases of high atomic number), the spectra at the instant of maximum radiation consisted of continuous radiation with very diffuse and unresolved lines of singly and doubly ionized atoms of the gas; at later instants, a large number of lines of the ionized gas appear. In the lighter gases (air, neon), the line spectrum is pronounced even at the instant of maximum radiation. For nitrogen, argon, air, and xenon, the distribution of the spectral brightness density at the instant of maximum radiation corresponds to the brightness distribution of an absolute black body. A

Card 1/2