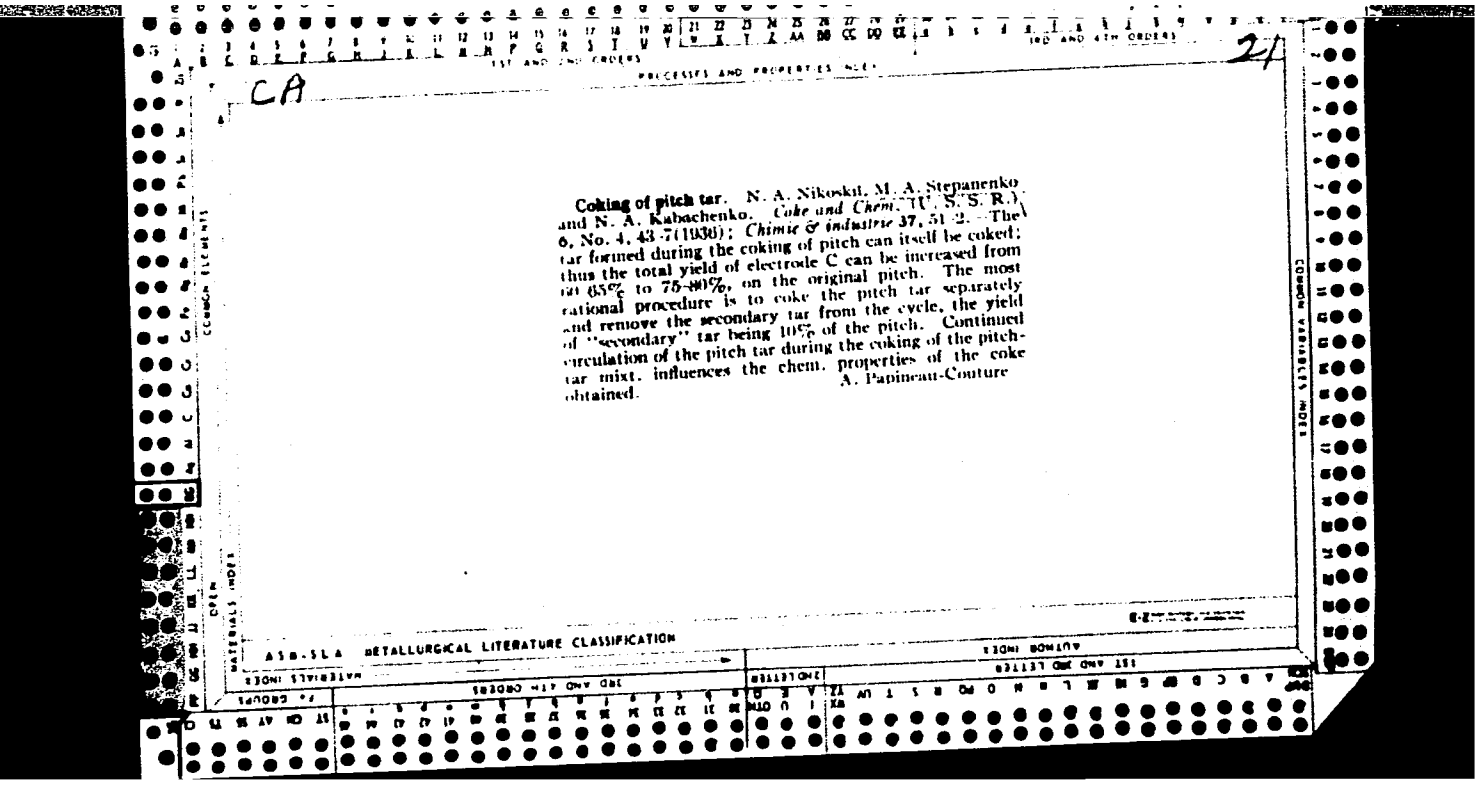
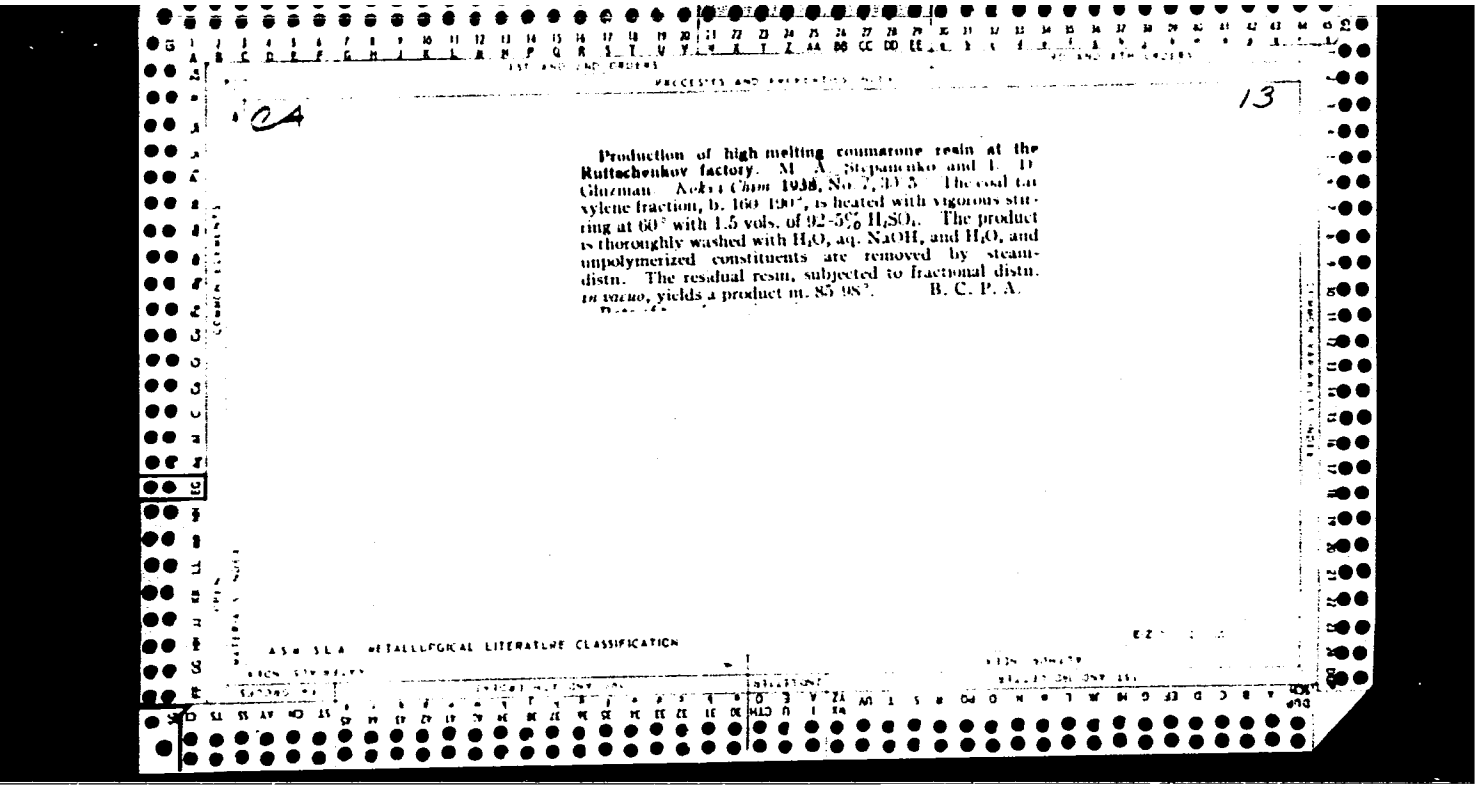


CA

Coking of pitch tar. N. A. Nikoskii, M. A. Stepanenko, and N. A. Kubachenko. *Coke and Chem.* U. S. S. R.), 6, No. 4, 43-7 (1936); *Chimie & industrie* 37, 51-2.—The tar formed during the coking of pitch can itself be coked; thus the total yield of electrode C can be increased from 60-65% to 75-80%, on the original pitch. The most rational procedure is to coke the pitch tar separately and remove the secondary tar from the cycle, the yield of "secondary" tar being 10% of the pitch. Continued circulation of the pitch tar during the coking of the pitch-tar mixt. influences the chem. properties of the coke obtained.
A. Papineau-Couture

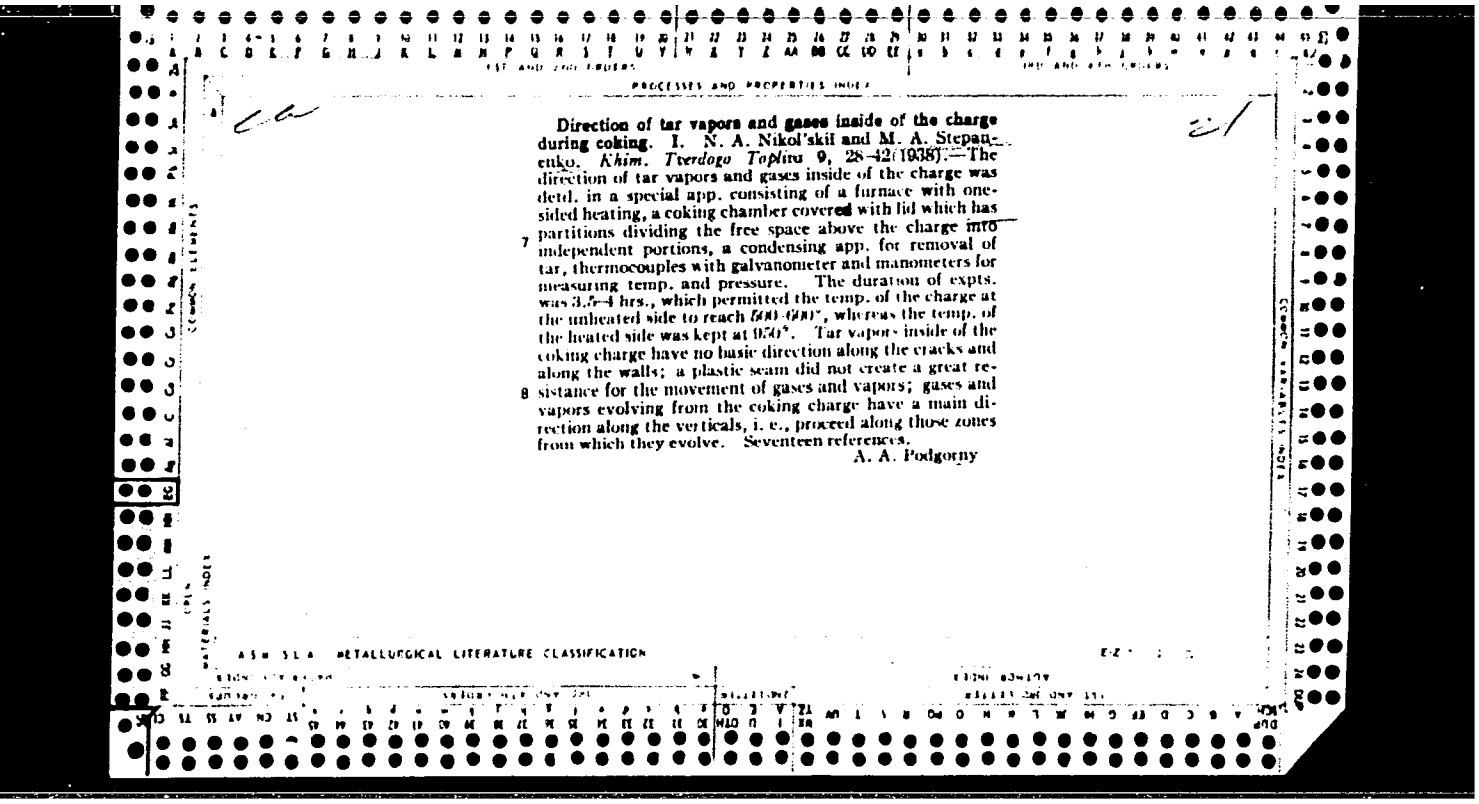


CA

13

Production of high melting coumarone resin at the Ruttschenkov factory. M. A. Stepanenko and I. D. Glazman. *Koks i Khim* 1938, No. 7, 33-5. The coal tar xylene fraction, b. 160-190°, is heated with vigorous stirring at 60° with 1.5 vols. of 92-5% H_2SO_4. The product is thoroughly washed with H_2O, aq. NaOH, and H_2O, and unpolymerized constituents are removed by steam-distn. The resulting resin, subjected to fractional distn. *in vacuo*, yields a product m. 85-98°. B. C. P. A.

ASM SLA METALLURGICAL LITERATURE CLASSIFICATION

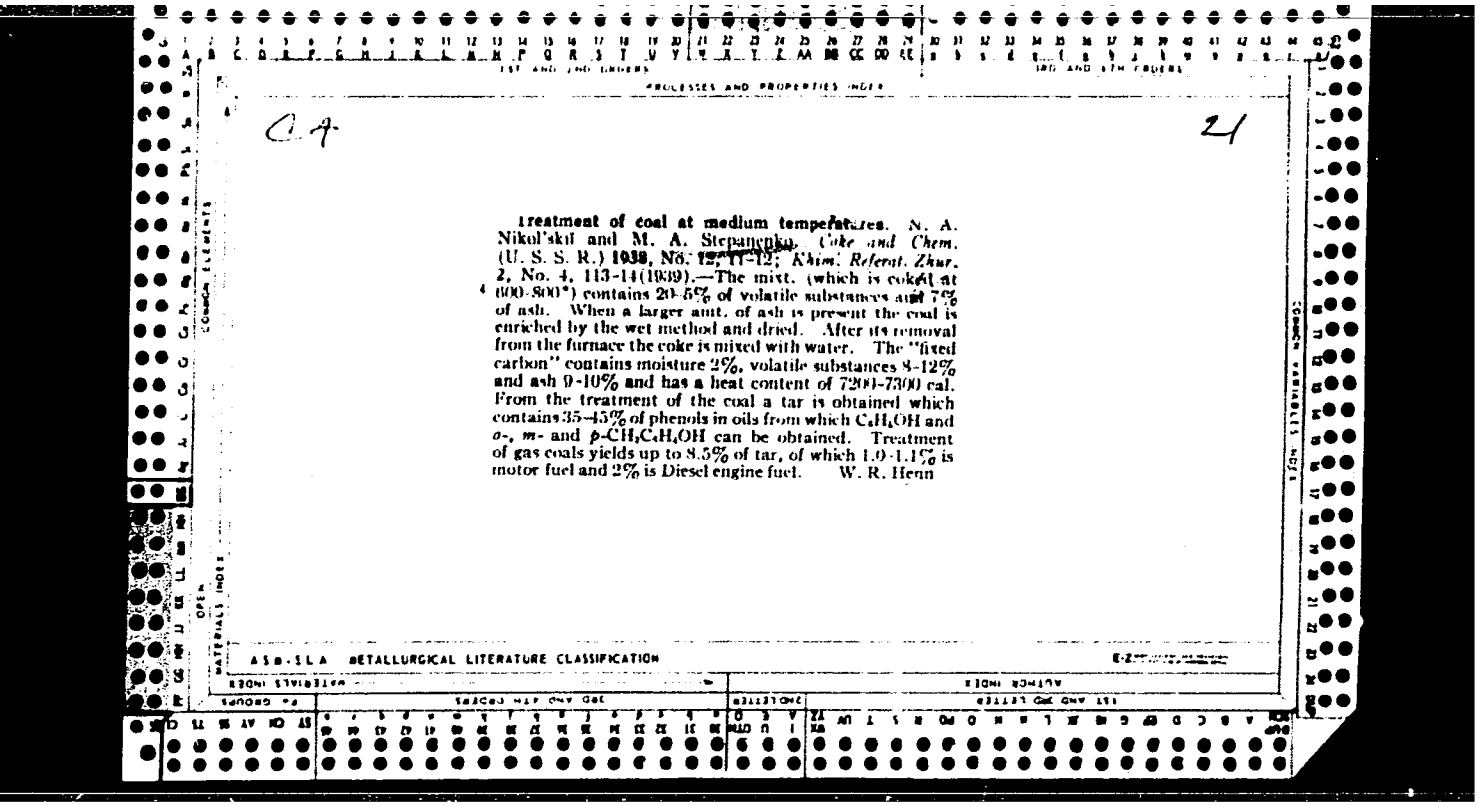


PROCESSES AND PROPERTIES INDEX

Direction of tar vapors and gases inside of the charge during coking. I. N. A. Nikol'skii and M. A. Stepanenko. *Khim. Tverdogo Topliva* 9, 28–42 (1938).—The direction of tar vapors and gases inside of the charge was detd. in a special app. consisting of a furnace with one-sided heating, a coking chamber covered with lid which has partitions dividing the free space above the charge into independent portions, a condensing app. for removal of tar, thermocouples with galvanometer and manometers for measuring temp. and pressure. The duration of expts. was 3.5–4 hrs., which permitted the temp. of the charge at the unheated side to reach 600–680°, while the temp. of the heated side was kept at 970°. Tar vapors inside of the coking charge have no basic direction along the cracks and along the walls; a plastic seam did not create a great resistance for the movement of gases and vapors; gases and vapors evolving from the coking charge have a main direction along the verticals, i. e., proceed along those zones from which they evolve. Seventeen references.

A. A. Podgorny

A S M S L A METALLURGICAL LITERATURE CLASSIFICATION

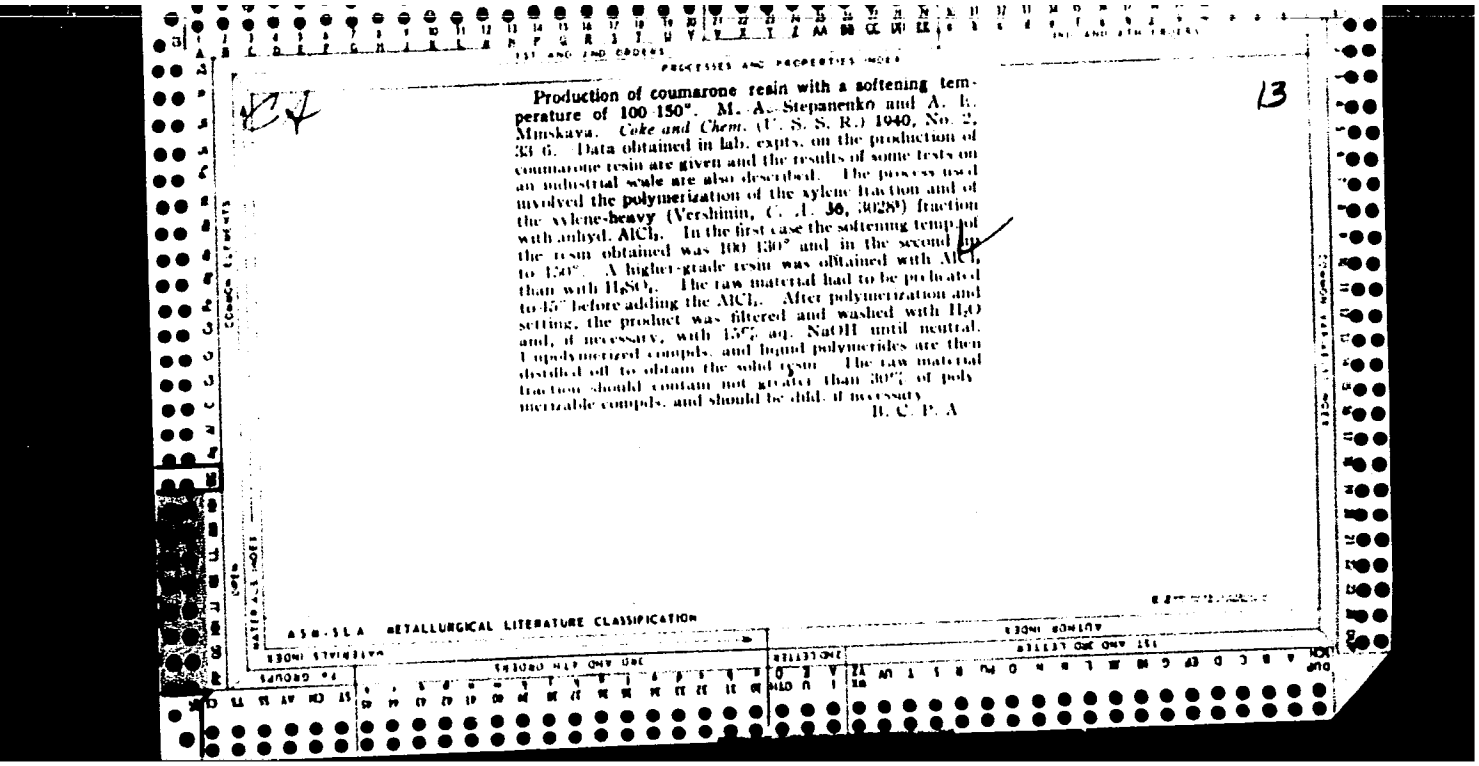


C4

21

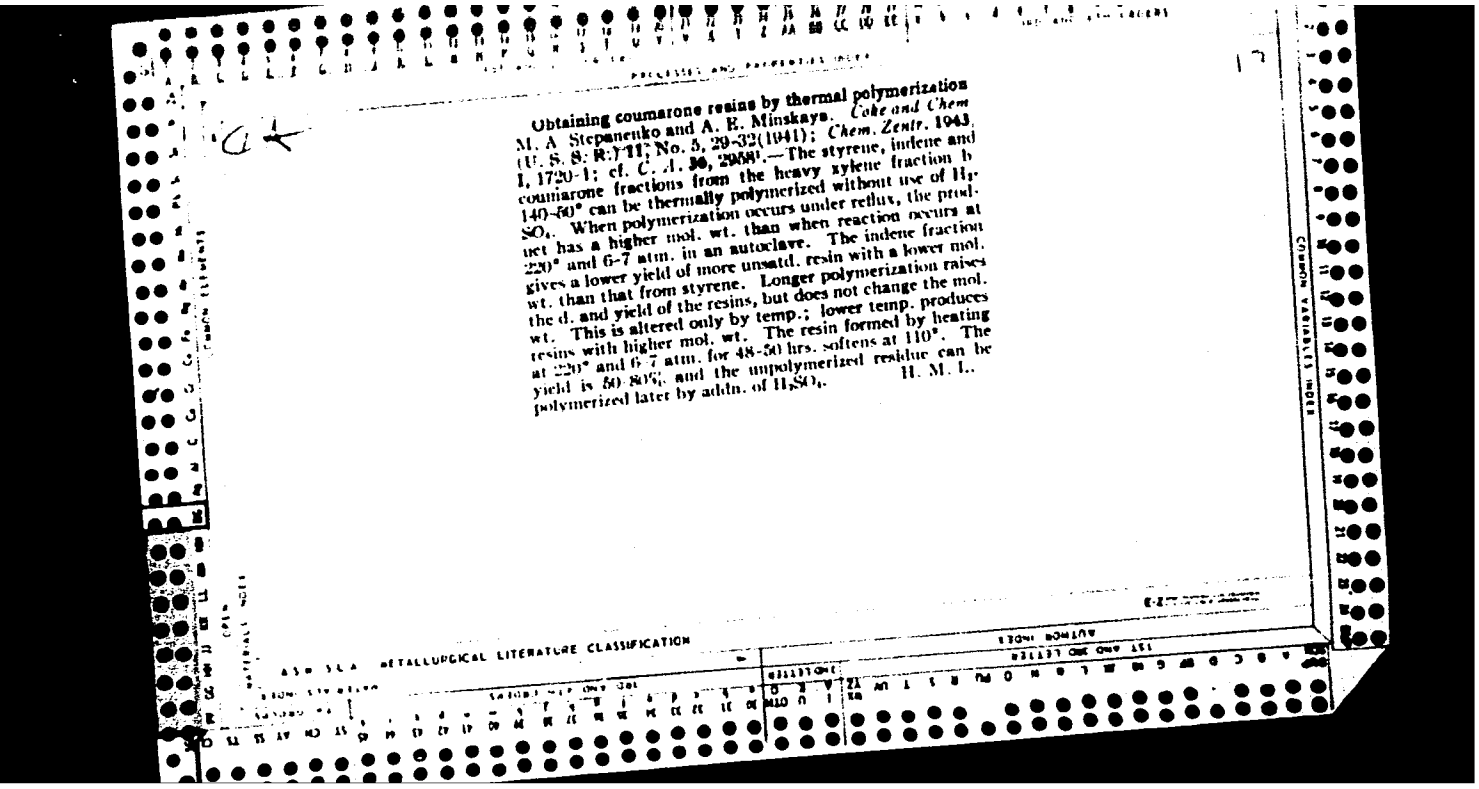
Treatment of coal at medium temperatures. N. A. Nikol'skii and M. A. Stepanenko. *Coke and Chem.* (U. S. S. R.) **1938**, No. 12, 11-12; *Khim. Referat. Zhur.* 2, No. 4, 113-14(1939).—The mixt. (which is coked at 600-800°) contains 20-5% of volatile substances and 7% of ash. When a larger amt. of ash is present the coal is enriched by the wet method and dried. After its removal from the furnace the coke is mixed with water. The "fixed carbon" contains moisture 2%, volatile substances 8-12% and ash 9-10% and has a heat content of 7200-7300 cal. From the treatment of the coal a tar is obtained which contains 35-45% of phenols in oils from which C_6H_5OH and *o*-, *m*- and *p*-$CH_3C_6H_4OH$ can be obtained. Treatment of gas coals yields up to 8.5% of tar, of which 1.0-1.1% is motor fuel and 2% is Diesel engine fuel. W. R. Henn

A50-51A METALLURGICAL LITERATURE CLASSIFICATION



Production of coumarone resin with a softening temperature of 100-150°. M. A. Stepanenko and A. L. Minskaya. *Coke and Chem.* (U. S. S. R.) 1940, No. 2, 33-6. Data obtained in lab. expts. on the production of coumarone resin are given and the results of some tests on an industrial scale are also described. The process used involved the polymerization of the xylene fraction and of the xylene-heavy (Vershinin, *C. A.* **36**, 3028[9]) fraction with anhyd. $AlCl_3$. In the first case the softening temp. of the resin obtained was 100-130° and in the second up to 150°. A higher-grade resin was obtained with $AlCl_3$ than with H_2SO_4. The raw material had to be preheated to 45° before adding the $AlCl_3$. After polymerization and setting, the product was filtered and washed with H_2O and, if necessary, with 15% aq. NaOH until neutral. Unpolymerized compds. and liquid polymerides are then distilled off to obtain the solid resin. The raw material fraction should contain not greater than 30% of polymerizable compds. and should be dild. if necessary.

B. C. P. A



Obtaining coumarone resins by thermal polymerization M. A. Stepanenko and A. E. Minskaya. *Coke and Chem* (U. S. S. R.) 7-11; No. 5, 29-32(1941); *Chem. Zentr.* 1943, I, 1720-1; cf. C. A. **36**, 2058¹.—The styrene, indene and coumarone fractions from the heavy xylene fraction b 140–50° can be thermally polymerized without use of H_2SO_4. When polymerization occurs under reflux, the product has a higher mol. wt. than when reaction occurs at 220° and 6–7 atm. in an autoclave. The indene fraction gives a lower yield of more unsatd. resin with a lower mol. wt. than that from styrene. Longer polymerization raises the d. and yield of the resins, but does not change the mol. wt. This is altered only by temp.; lower temp. produces resins with higher mol. wt. The resin formed by heating at 220° and 6–7 atm. for 48–50 hrs. softens at 110°. The yield is 50–80% and the unpolymerized residue can be polymerized later by addn. of H_2SO_4. H. M. L.

68-1-9/21

AUTHOR: Stepanenko, M.A., Doctor of Technical Sciences, and Matusyak, N.I., Gogoleva, T.Ya., Engineers.

TITLE: Coal Oil Pitch as a Binding Material for Briquetting Coals. (Uglemaslyanyy pek - svyazuyushchiy material dlya briketirovaniya ugley)

PERIODICAL: Koks i Khimiya, 1957, No.1, pp. 32 - 35 (USSR)

ABSTRACT: A product obtained by a thermal treatment of a mixture of coal and high boiling fractions of pitch distillates of anthracene fraction II, as a solvent is called coal oil pitch. In the paper the preparation of coal oil pitch and its further use as a binder for briquetting coal is described. Coal oil pitches were prepared from coals Г, ПЖ, К and ПС and a mixture of anthracene fraction II and heavy pitch distillates (ratio 1:1.2). Properties of coals and solvents are given in Tables 1 and 2, respectively. Preparation of coal oil pitch: coal crushed to -3 mm is mixed with the solvent (% of solvent for Г, ПЖ and К - 32% and for ПС - 24%) and heated for 3 hours at 360 - 380 °C. The yield and properties of coal oil pitch obtained are given in Table 3. Coal T was briquetted under the following conditions: softening temperature of coal oil pitch - 65 - 75 °C; proportion of the binder 12%; fineness of coal - crushed to 3 mm; temperature of mixing and pressing 150 °C, the temperature of the press-mould 95 °C.

Card 1/2

Coal Oil Pitch as a Binding Material for Briquetting Coals.

pressing pressure 400 kg/cm^2. The shape of briquettes is shown on the photograph. Changes on storing of the properties of the binders used are shown in Table 4, and changes in the mechanical properties of briquettes on storing, in Table 5. The quality of briquettes was good; they ignite at 900 °C, initially with a smokey flame and then with a colourless flame. There are 1 figure, 5 tables and 2 Slavic references.

ASSOCIATION: UKhIN

AVAILABLE: Library of Congress

Card 2/2

STEPANENKO, M.A.

68-7-11/16

AUTHORS: Stepanenko, M.A., Matusyak, N.I. (UKhIN), Kuleshov, P.Ya., and Saltan, P.L.

TITLE: Intensification of the Process of Production of High Melting Pitch. (Intensifikatsiya protsessa polucheniya vysokoplavkogo peka).

PERIODICAL: Koks i Khimiya, 1957, Nr 7, pp.43-46 (USSR)

ABSTRACT: The use of oxygen for the intensification of the process of production of high melting pitch was investigated on a laboratory and works' scale. The comparison of laboratory experiments of blowing medium pitch, pitch tar and their mixture (75% + 25% respectively) with air and oxygen is given in Table 1 and Fig.1. When blowing with oxygen (18 l/hr per kg of pitch) the waste gas contained about 60 to 70% of oxygen. Better utilisation of oxygen was obtained when additional mechanical stirring was applied, so that oxygen consumption was reduced to 6 l/hr per kg of pitch per hr (Table 2). Industrial experiments were carried out in two continuously operating reactors joined in series. Dimension of the reactor: d = 3 m; h total 4.7 m, the ratio of h pitch to d = 1.6; charge 59 tons. The comparison of results obtained in laboratory and works' experiments is given in Table 3. It was found that by replacing air with oxygen,

Card 1/2

68-7-11/16

Intensification of the Process of Production of High Melting Pitch.

the reaction time and the total oxygen consumption can be decreased by 2.5 - 3.0 times (at similar blowing velocities), or the reaction time can be decreased by 1.5 - 2.0 times with a decrease in the total consumption of oxygen by 6-7 times (in comparison with air). In the latter case the use of mechanical stirring is necessary. In considering the most suitable type of apparatus for blowing oxygen it is stated that a bubbler type reactor is the most suitable. There are 3 tables and 2 figures.

ASSOCIATION: Zaporozhskiy Coke Oven Works. (Zaporozhskiy Koksokhimicheskiy Zavod).

AVAILABLE: Library of Congress

Card 2/2

PERIODICAL: Koks i Khimiya, 1957, Nr 10, pp. [illegible]

ABSTRACT: Laboratory experiments on the production of pitch with high softening temperatures are described. It was possible to obtain two types of pitch: (a) pitch with a softening temperature considerably above 150°C but fluid at high temperatures and (b) pitch with a volatile content of 18-20% high melting temperature and remaining solid at 300°C. For the production of the latter type of pitch mechanical agitation was found to be necessary. The apparatus used is shown in Fig.1; experimental conditions in Table 2; properties of pitches obtained and their elemental composition in Tables 2 and 3 respectively; the evolution of gas on coking of high softening pitch in Figs. 2 and 3; plastometric properties of pitch with volatile content of 18.5% in Fig.4. There are 3 tables and 4 figures.

ASSOCIATION: UKhIN.

AVAILABLE: Library of Congress.

Card 1/1

68-58-2-5/21

AUTHORS: Stepanenko, M.A., Soldatenko, Ye.M., Matusyak, N.I. and Bogoyavlenskiy, K.A.

TITLE: X-ray Analysis of Pitch Cokes (Rentgenostrukturnyy analiz pekovykh koksov)

PERIODICAL: Koks i Khimiya, 1958, Nr 2, pp 31 - 35 (USSR)

ABSTRACT: Results of X-ray structural investigations of pitch cokes from Zaporozhe, Khanzhenskovsk and Kemerovsk Coke Oven Works are described. In the evaluation of pitch coke as a raw material for the electrode industry, the most important is not so much its initial characteristics, but the dynamics of changes of the individual indices on thermal treatment and in particular the ability to increase the density. Therefore, not only initial samples were studied, but also samples which were submitted to ignition and graphitisation in industrial furnaces of the Dneprovsk Electrode Works. In addition to parameters of X-ray structural analysis, as indices characterising the coke substance and its structure, the chemical composition, specific gravity and specific electrical conductivity were determined. Copper radiation with a nickel filter was used for X-ray powder photographs. As a criterion of the degree of order, the sizes of "packets" along c and a axis were taken, i.e. the width of interference bands (002) and (10)

Card1/2

X-ray Analysis of Pitch Cokes 68-58-2-5/21

The results obtained are assembled in the table.
There are 2 figures, 1 table and 7 Soviet references.

ASSOCIATION: UKhIN

AVAILABLE: Library of Congress

Card 2/2

1. Coke - Properties 2. Coke - Structural analysis
3. Coke - X-ray analysis 4. X-rays - Applications

SOV/68-59-4-13/23

AUTHORS: Gogoleva, T.Ya. and Stepanenko, N.A.

TITLE: Surface Tension, Density and Viscosity of Coal Tar Pitch (Poverkhnostnoye natyazheniye, plotnost' i vyazkost' kamennougol'nogo peka)

PERIODICAL: Koks i Khimiya, 1959, Nr 4, pp 42-45 (USSR)

ABSTRACT: An investigation of the above properties of coal tar pitches at elevated temperatures produced on the Zaporozh'ye Works has been carried out. The characteristic data on pitches investigated are given in table 1 and the results obtained in table 2 and figures 3-6. The apparatus used for the determination of surface tension and viscosity are shown in Fig 1 and 2 respectively. It was found that the temperature-density relationship in the region of high temperatures (180 to 360°C) is linear. Coefficients of thermal expansion of pitches with softening temperatures 65, 83 and 145°C were calculated and the dependence of the above coefficients on the softening temperature of pitch was determined (an increase of the softening temperature by 1° is accompanied by a decrease in the coefficient of thermal

Card 1/2

Surface Tension, Density and Viscosity of Coal Tar Pitch

expansion by 0.000001). The viscosity of medium pitches within the temperature range 155 to 295°C and of high softening pitch in the range of 240 to 345°C was determined (Fig 5). The dynamics of changes in the viscosity of pitch with increasing heating temperature were studied. Two regions of a sharp change in the viscosity of pitch were observed: one on passing from the solid state into the plastic state and the other on passing from plastic state into the fluid state (Fig 6). There are 6 figures and 2 tables.

ASSOCIATION: UKhIN

GOGOLEVA, T. Ya., STEPANENKO, M.A.

Thermography of the coking process of coal-tar pitches. Koks i khim. no.3:47-51 '60. (MIRA 13:6)

1. Ukrainskiy uglekhimicheskiy institut.
(Pitch)

STEPANENKO, M.A.; MATUSYAK, N.I.

Physicochemical properties of pitch coke. Koks i khim. no.6:28-31 '60. (MIRA 13:7)

1. Ukrainskiy uglekhimicheskiy institut.
(Coke)

STEPANENKO, Mariya Aleksandrovna; BRON, Yakov Abramovich; KULAKOV, Nikolay Konstantinovich; LEYTES, V.A., otv.red.; LIBERMAN, S.S., red.izd-va; ANDREYEV, S.P., tekhn.red.

[Production of pitch coke] Proizvodstvo pekovogo koksa. Khar'kov, Gos.nauchno-tekhn.izd-vo lit-ry po chernoi i tsvetnoi metallurgii, 1961. 311 p. (MIRA 14:7)
(Coke industry--Equipment and supplies)

STEPANENKO, M.A.; MATUSYAK, N.I.

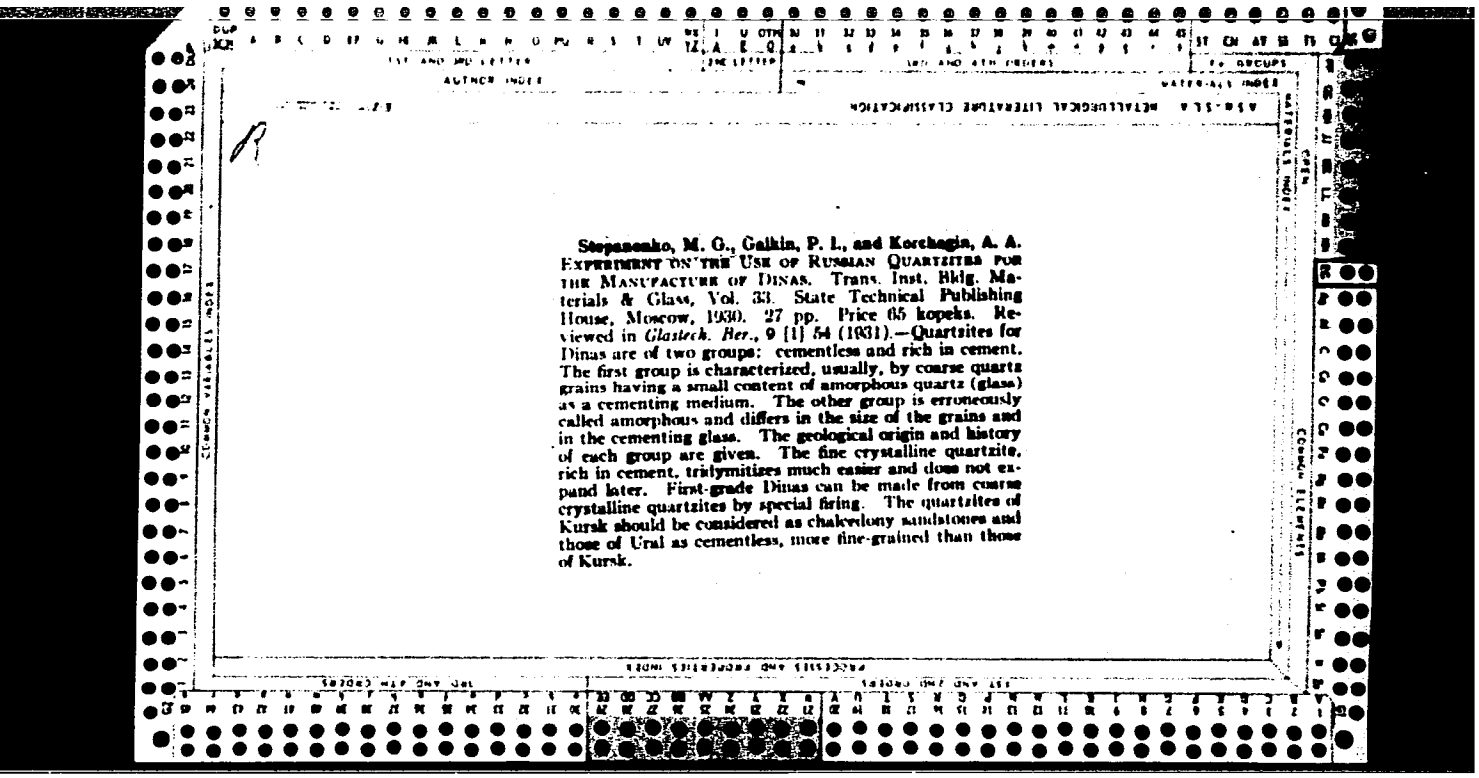
Physicochemical characteristics of coal pitch coke. Koks i khim. no.1:29-33 '63. (MIRA 16:2)

1. Ukrainskiy uglekhimicheskiy institut.
(Coke—Testing)

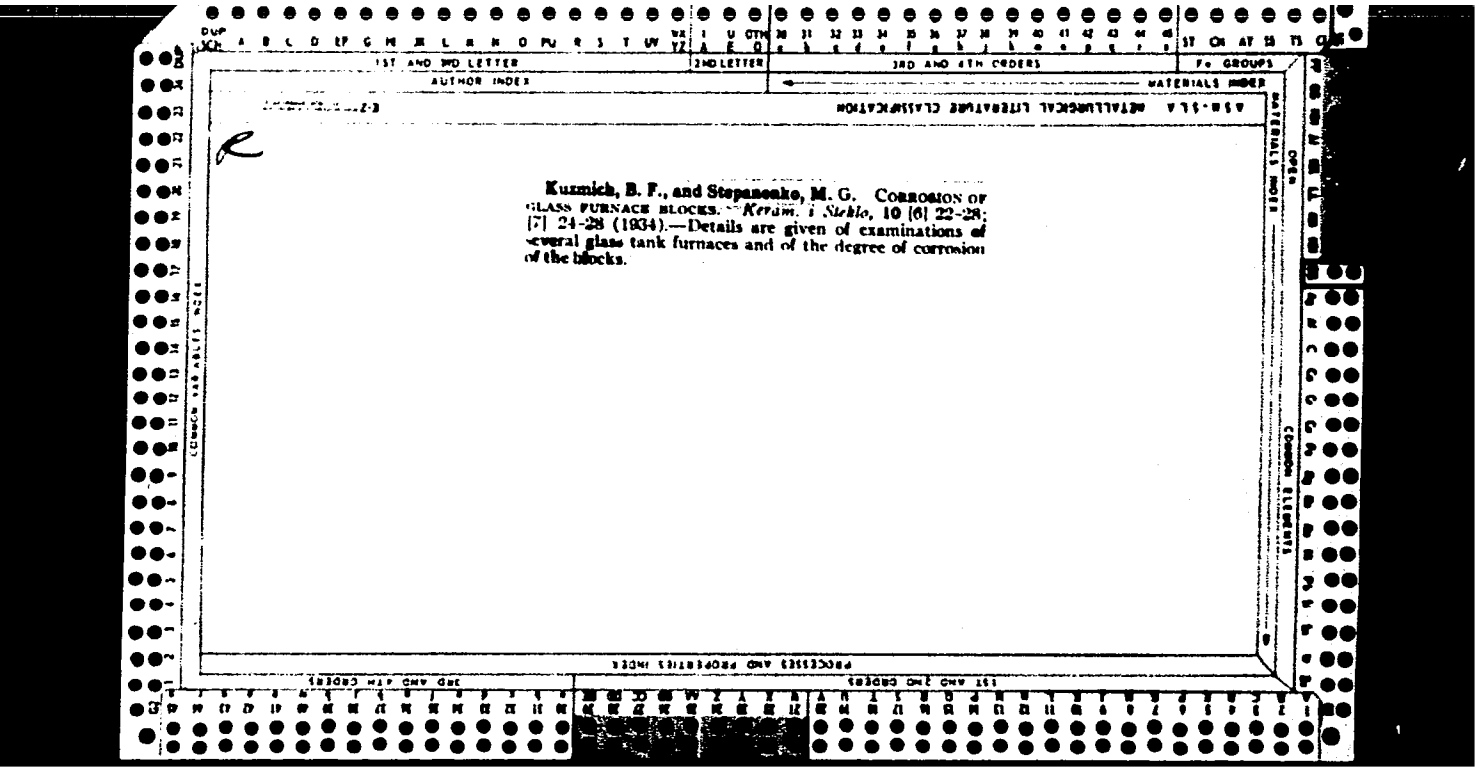
STEPANENKO, M.A.; GOGOLEVA, T.Ya.

Uses of coal-oil pitch. Koks i khim. no.12:43-45 '63.
(MIRA 17:1)

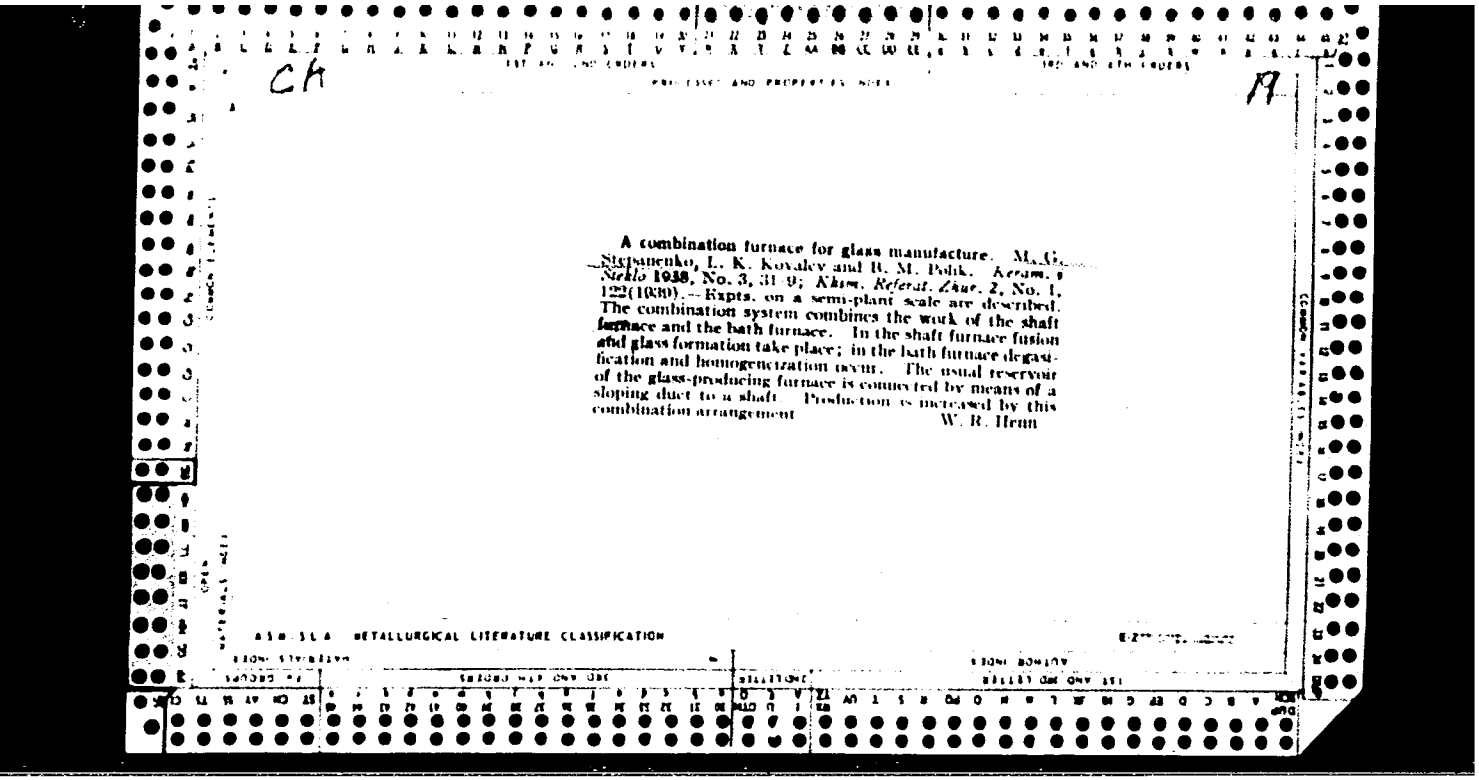
1. Ukrainskiy uglekhimicheskiy institut.



Stepanenko, M. O., Galkin, P. L., and Korchagin, A. A. EXPERIMENT ON THE USE OF RUSSIAN QUARTZITES FOR THE MANUFACTURE OF DINAS. Trans. Inst. Bldg. Materials & Glass, Vol. 33. State Technical Publishing House, Moscow, 1930. 27 pp. Price 65 kopeks. Reviewed in *Glastech. Ber.*, 9 [1] 54 (1931).—Quartzites for Dinas are of two groups: cementless and rich in cement. The first group is characterized, usually, by coarse quartz grains having a small content of amorphous quartz (glass) as a cementing medium. The other group is erroneously called amorphous and differs in the size of the grains and in the cementing glass. The geological origin and history of each group are given. The fine crystalline quartzite, rich in cement, trilymitizes much easier and does not expand later. First-grade Dinas can be made from coarse crystalline quartzites by special firing. The quartzites of Kursk should be considered as chalcedony sandstones and those of Ural as cementless, more fine-grained than those of Kursk.

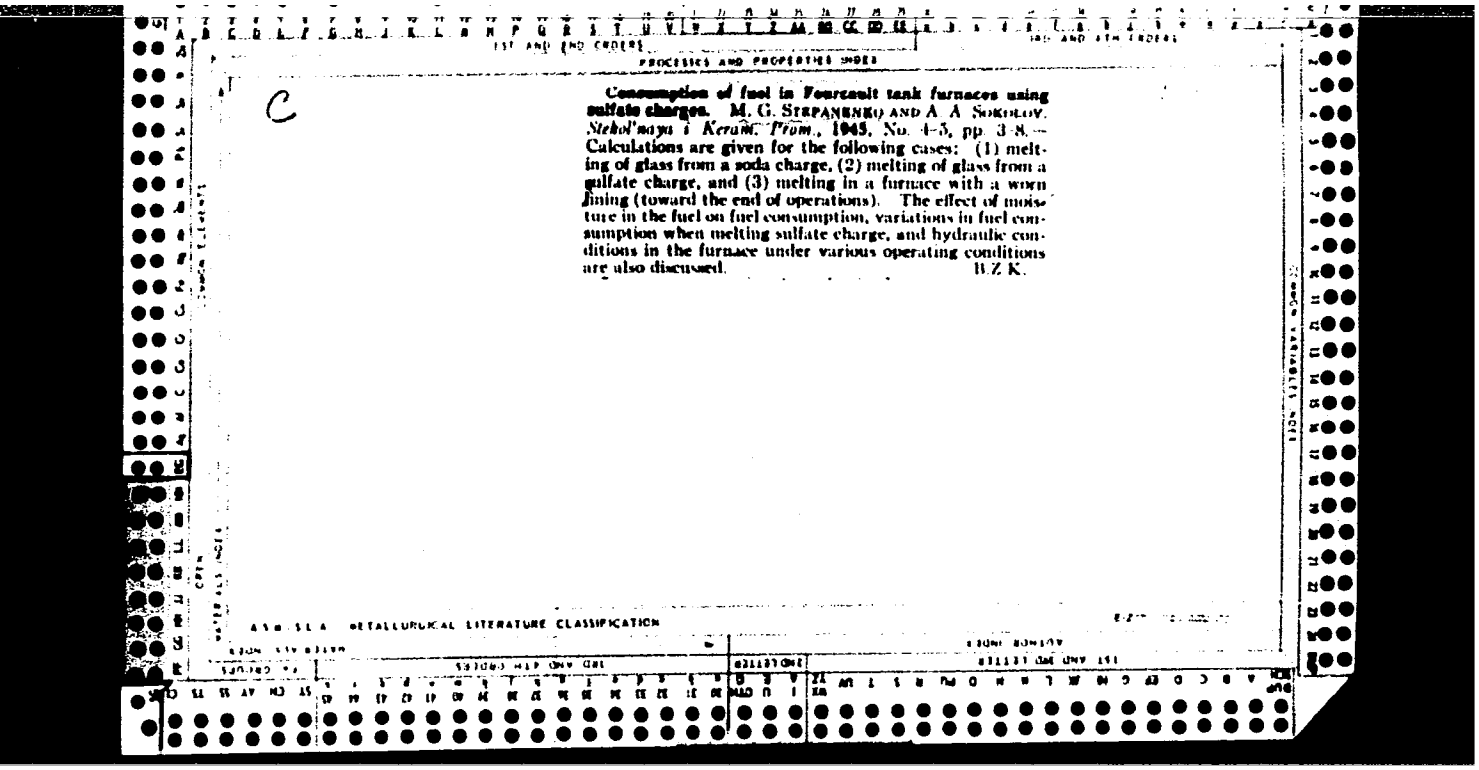


Kuzmich, B. F., and Stepanenko, M. G. CORROSION OF GLASS FURNACE BLOCKS. *Keram. i Steklo*, 10 [6] 22-28; [7] 24-28 (1934).—Details are given of examinations of several glass tank furnaces and of the degree of corrosion of the blocks.



A combination furnace for glass manufacture. M. G. Stepanenko, L. K. Kovalev and B. M. Polik. *Avtom. i Stekla* **1938**, No. 3, 31–9; *Khim. Referat. Zhur.* **2**, No. 1, 122(1939).—Expts. on a semi-plant scale are described. The combination system combines the work of the shaft furnace and the bath furnace. In the shaft furnace fusion and glass formation take place; in the bath furnace degasification and homogenization occur. The usual reservoir of the glass-producing furnace is connected by means of a sloping duct to a shaft. Production is increased by this combination arrangement.

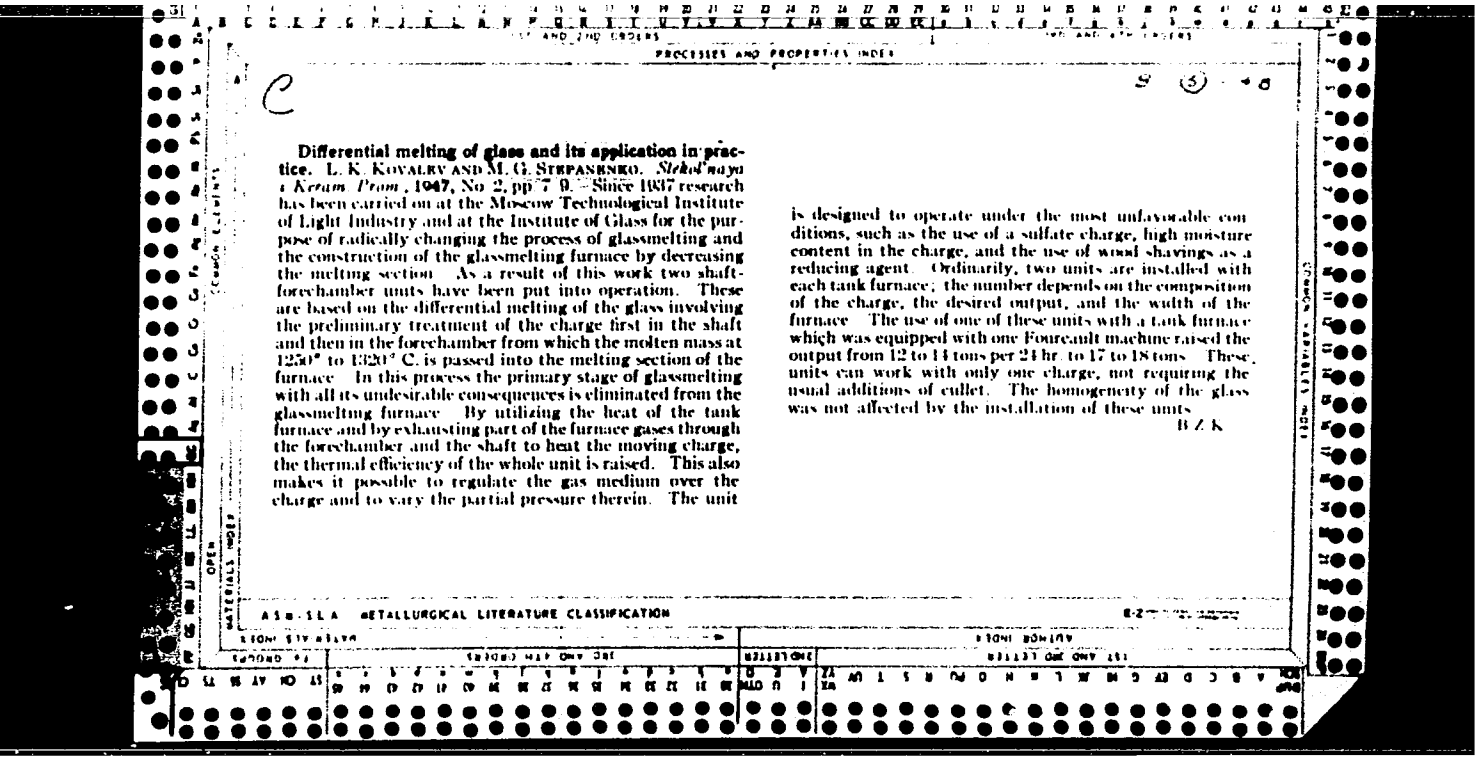
W. R. Brun



C

Consumption of fuel in Fourcault tank furnaces using sulfate charges. M. G. Stepanenko and A. A. Sokolov. *Steklo'naya i Keram. Prom.*, 1945, No. 4–5, pp. 3–8.—Calculations are given for the following cases: (1) melting of glass from a soda charge, (2) melting of glass from a sulfate charge, and (3) melting in a furnace with a worn lining (toward the end of operations). The effect of moisture in the fuel on fuel consumption, variations in fuel consumption when melting sulfate charge, and hydraulic conditions in the furnace under various operating conditions are also discussed. B.Z.K.

METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

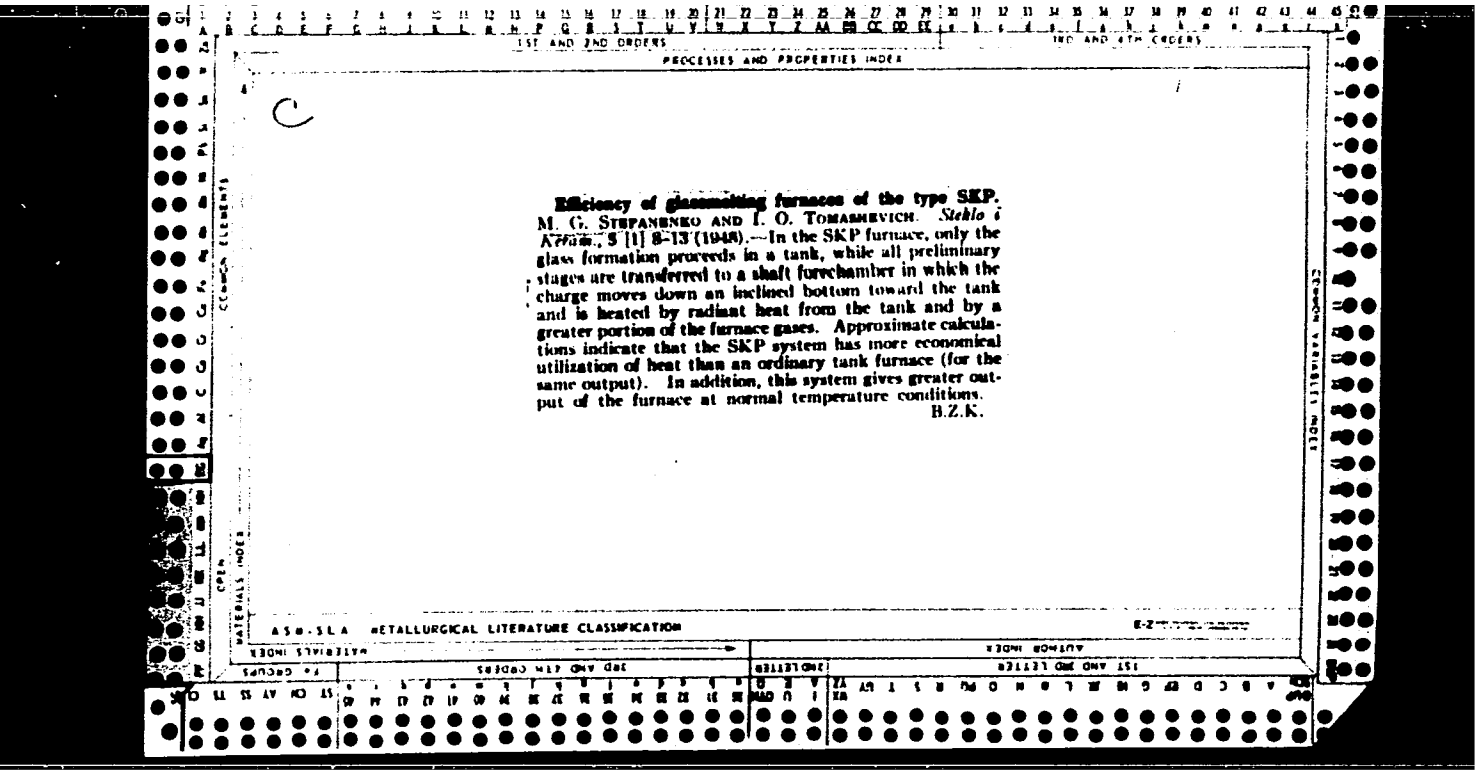
C

S (3) - 48

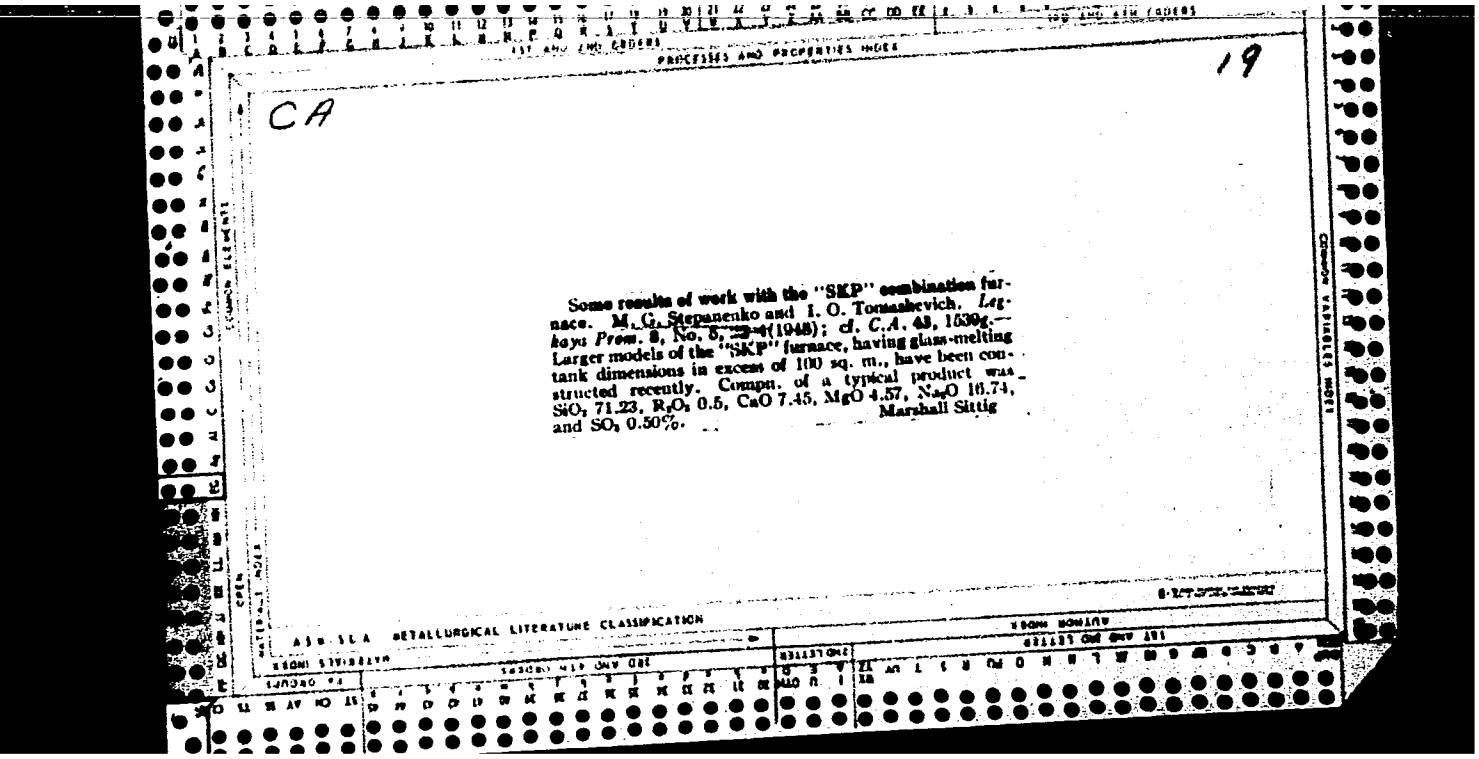
Differential melting of glass and its application in practice. L. K. KOVALEV AND M. G. STEPANENKO. *Steklo i Keram. Prom.*, 1947, No 2, pp 7–9. — Since 1937 research has been carried on at the Moscow Technological Institute of Light Industry and at the Institute of Glass for the purpose of radically changing the process of glassmelting and the construction of the glassmelting furnace by decreasing the melting section. As a result of this work two shaft-forechamber units have been put into operation. These are based on the differential melting of the glass involving the preliminary treatment of the charge first in the shaft and then in the forechamber from which the molten mass at 1250° to 1320° C. is passed into the melting section of the furnace. In this process the primary stage of glassmelting with all its undesirable consequences is eliminated from the glassmelting furnace. By utilizing the heat of the tank furnace and by exhausting part of the furnace gases through the forechamber and the shaft to heat the moving charge, the thermal efficiency of the whole unit is raised. This also makes it possible to regulate the gas medium over the charge and to vary the partial pressure therein. The unit is designed to operate under the most unfavorable conditions, such as the use of a sulfate charge, high moisture content in the charge, and the use of wood shavings as a reducing agent. Ordinarily, two units are installed with each tank furnace; the number depends on the composition of the charge, the desired output, and the width of the furnace. The use of one of these units with a tank furnace which was equipped with one Fourcault machine raised the output from 12 to 14 tons per 24 hr. to 17 to 18 tons. These units can work with only one charge, not requiring the usual additions of cullet. The homogeneity of the glass was not affected by the installation of these units.

B Z K

A1a-11A METALLURGICAL LITERATURE CLASSIFICATION



Efficiency of glassmelting furnaces of the type SKP. M. G. Stepanenko and I. O. Tomashevich. *Stekło i Keram.*, 5 [1] 8–13 (1948).—In the SKP furnace, only the glass formation proceeds in a tank, while all preliminary stages are transferred to a shaft forechamber in which the charge moves down an inclined bottom toward the tank and is heated by radiant heat from the tank and by a greater portion of the furnace gases. Approximate calculations indicate that the SKP system has more economical utilization of heat than an ordinary tank furnace (for the same output). In addition, this system gives greater output of the furnace at normal temperature conditions.
B.Z.K.



CA

19

Some results of work with the "SKP" combination furnace. M. G. Stepanenko and I. O. Tomashevich. *Lagkaya Prom.* 8, No. 8, [illegible] (1948); cf. *C.A.* 43, 1530g.—Larger models of the "SKP" furnace, having glass-melting tank dimensions in excess of 100 sq. m., have been constructed recently. Compn. of a typical product was SiO_2 71.23, R_2O_3 0.5, CaO 7.45, MgO 4.57, Na_2O 16.74, and SO_3 0.50%. Marshall Sittig

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

STEPANENKO, M. G.

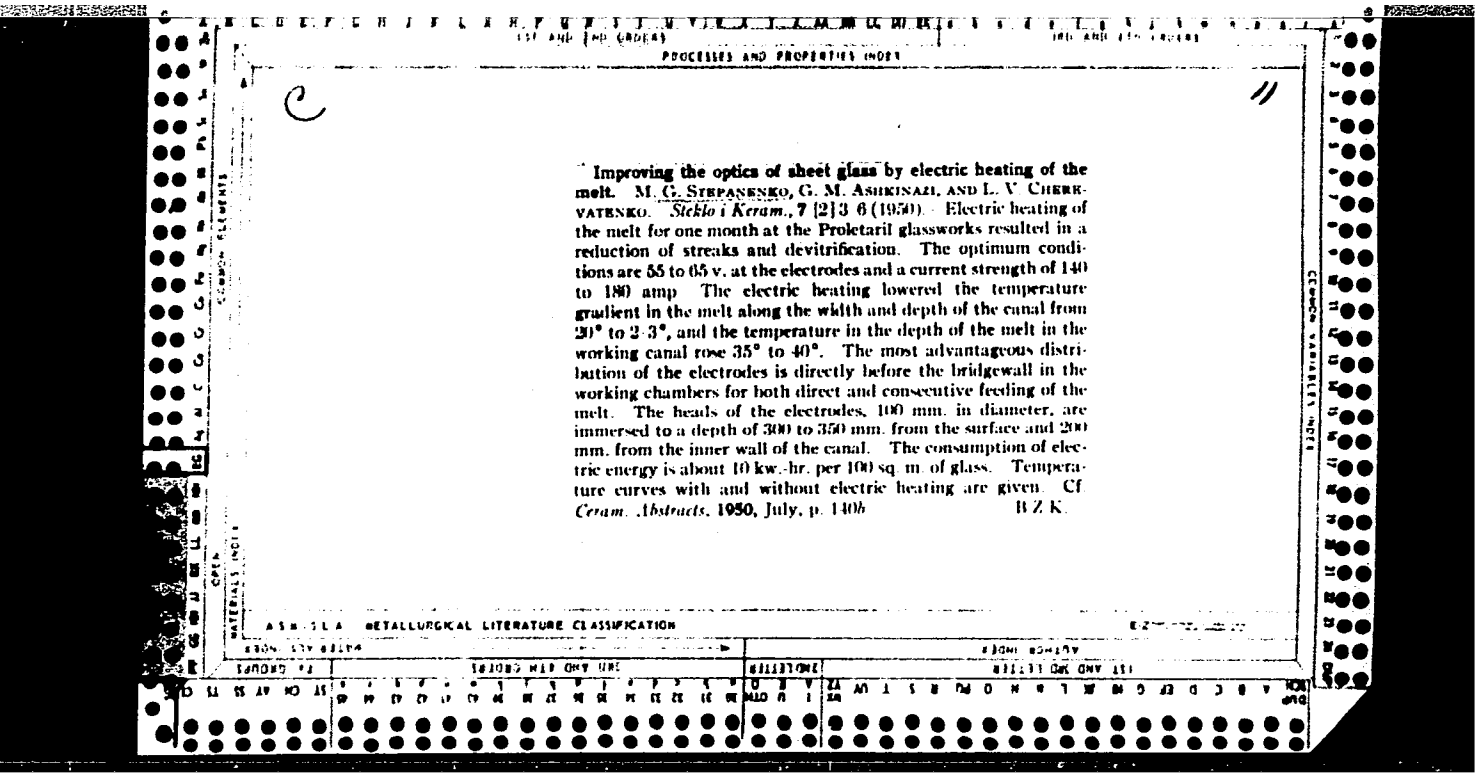
Electric heating of glass in the Foureault channel. G. M. Ashkinazi, E. V. Zhukovskii, and M. G. Stepanenko. Steklo i Keram., 6 (3) 3-9 (1949). --Electric heating was undertaken to combat streaks and devitrification. The electrodes (3-in. steel tubes) were immersed to a depth of 20cm. It was possible to attain complete isothermy of the melt under the debiteuse, with a total rise in temperature in this zone of 30°. Temperature distribution along the depth of the melt in the preheating chambers was considerably improved. Temperature difference between the surface and a depth of 55 cm. was reduced from 160° (original temperature) to 110°C. Equalization of temperature was caused by a 15° to 20° drop in the upper levels and a 30° to 40° rise at a depth of 30 to 55 cm. At a depth of 55 cm., the temperature rose from 990° to 1030°, thus eliminating the possibility of crystallization. Devitrification was completely eliminated, and streaks were considerably reduced. Temperature curves and a schematic diagram of the electrical system are given.

B.Z.K.

CA

19

Rational dimensions of tank-furnace regenerators. M. G. [redacted]. *Stekło i Keram.* 7, No. 1, 5–9(1950).—Math. analysis of operation and limitations of regenerators for tank furnaces using generator gas of 1000–1500 cal./m.³. With gas of 1500 cal./m.³, heating temps. higher than 1150° should not be expected; under ordinary conditions, with gas of 1100–1300 cal./m.³, the temp. of air (and gas) will not exceed 950–1000°. The specific surface of the regenerator should be 33–6 m.²/sq. m. of surface being heated (this was 115 m.² in these calcns.). B. Z. K.



PROCESSES AND PROPERTIES INDEX

Improving the optics of sheet glass by electric heating of the melt. M. G. Stepanenko, G. M. Ashkinazi, and L. V. Cherevatenko. *Steklo i Keram.*, **7** [2] 3–6 (1950). Electric heating of the melt for one month at the Proletaril glassworks resulted in a reduction of streaks and devitrification. The optimum conditions are 55 to 65 v. at the electrodes and a current strength of 140 to 180 amp. The electric heating lowered the temperature gradient in the melt along the width and depth of the canal from 20° to 2–3°, and the temperature in the depth of the melt in the working canal rose 35° to 40°. The most advantageous distribution of the electrodes is directly before the bridgewall in the working chambers for both direct and consecutive feeding of the melt. The heads of the electrodes, 100 mm. in diameter, are immersed to a depth of 300 to 350 mm. from the surface and 200 mm. from the inner wall of the canal. The consumption of electric energy is about 10 kw.-hr. per 100 sq. m. of glass. Temperature curves with and without electric heating are given. Cf. *Ceram. Abstracts*, **1950**, July, p. 140*b*. B Z K.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

EYGENSON, L.S., doktor tekhnicheskikh nauk, professor; STEPANENKO, M.G., redaktor; GRIBOVA, M.P., tekhnicheskiy redaktor.

[Making models] Modelirovanie. Moskva, Gos.izd-vo "Sovetskaia nauka," 1952. 371 p. (MLRA 8:5)
(Engineering models)

STEPANENKO,M.G., professor, doktor tekhnicheskikh nauk

Importance of the convection flow in glass furnaces. Stek.i ker. 12 no.9:17-22 S'55. (MIRA 8:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut stekla
(Glass manufacture)

STEPANENKO, M.G., doktor tekhnicheskikh nauk, professor.

Design of a glass tank furnace. Stek. i ker. 13 no.9:27-28 S '56. (MLRA 9:10)

(Glass manufacture)

8 (4)

SOV/112-57-5-10448

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1957, Nr 5, p 131 (USSR)

AUTHOR: Stepanenko, M. G., Lur'ye, V. M.

TITLE: Design of Electric Glass-Melting Furnaces
(Proyektirovaniye elektricheskikh steklovarennykh pechey)

PERIODICAL: Tr. Vses. n.-i. in-ta stekla, 1956, Nr 36, pp 51-70

ABSTRACT: Electric glass-melting furnaces have a number of advantages compared to flame-type furnaces; it is expected that in the near future, when new large electric stations will be put in operation, such furnaces will receive wide usage in the USSR. At present, however, the problems of design and construction of glass-melting furnaces have not been satisfactorily solved, either in the USSR or abroad. In designing electric glass-melting furnaces, their fundamental parameters are selected after those of the flame-type furnaces, or else they are selected arbitrarily. As a result, the per-unit energy consumption of actual electric furnaces fluctuates widely. The prospects of electric glass melting require that reliable methods for designing

Card 1/4

Design of Electric Glass-Melting Furnaces

the furnaces be developed, particularly methods for furnaces of 80-120 tons per day capacity. The principal distinguishing feature of electric glass melting is that heat is produced within the glass melt proper; the heat is not transmitted via the glass-melt surface as in the flame-type furnaces. This results in a more uniform temperature distribution over the entire glass-melt volume, and in lower maximum temperatures at individual points; the temperature under the furnace roof does not exceed 1,250°C, which results in a higher electrode and lining durability. The process in an electric furnace can be forced by using higher glass-melt temperatures. Horizontal convection in an electric furnace is weak, and the furnace outlet requires additional heating. The glass-melt surface in the electric furnace is a cooling surface, hence the viscosity of the surface layers is higher. This can be prevented by a lower roof, by coating the surface with a special mixture, by a vacuum, and by placing high-capacity electrodes near the surface. Decreasing the surface area and making the bath deeper did not result in a decrease of heat losses

Design of Electric Glass-Melting Furnaces

through the surface because the losses through the walls increased. An operating voltage of 70-110 v is used; it can be increased to 220 v. The bath width must be limited in order to limit the voltage. As glass melt is electrically hot, workers and glass-forming machines that come in contact with the glass melt must be insulated from the ground. Usually the single-phase type of electric furnace is used. The most expedient surface configuration is a long rectangle. Attempts to construct a 3-phase furnace have been unsuccessful so far. The construction of an electric glass-melting furnace is much simpler than that of a flame-type; the electric furnaces are usually protected by a metal housing. Three types of electrodes are used; the wall type, the through type, and the semi-through type. The electrodes are made from a graphitized carbon or from high-melting metals. The latter require compressed-air cooling, which lowers their efficiency. With through-type electrodes, the temperature and current-density distribution over the glass melt is nonuniform because of different cooling conditions at various spots of

Design of Electric Glass-Melting Furnaces

the melt. Wall-type graphitized electrodes are the best. Thermal and electrical calculations of an electric glass-melting furnace are difficult, and in practice the required power is determined on the basis of the bath volume. The design methods for a single phase wall-electrode furnace suggested by the authors permit determining its fundamental parameters with sufficient accuracy, except for the calculated resistivity at various spots of the melt, which is associated with the distribution of working temperatures. Capacity per unit volume and energy consumption per ton of the glass produced are two most characteristic performance data.

V.P.Kh.

AUTHOR: Stepanenko, M. C. SOV/72-58-8-4/17

TITLE: Nomogram for the Determination of the Specific Heat Consumption in Glass Melting (Nomogramma dlya opredeleniya udel'nogo raskhoda tepla na varku stekla)

PERIODICAL: Steklo i keramika, 1958, Nr 8, pp. 8-12 (USSR)

ABSTRACT: The thermal parameters of the thermochemical reactions of glass melting have been known for a long time and were published by M. A. Matveyev, B. A. Kleymenov (Ref 1) as well as by Krëger (Ref 2) in technical literature. Also Kuzyak, Sukhov (Ref 2) and Professor Ginzburg (Ref 3) carried out research work in this field and obtained higher parameter values. The author prefers the data supplied by Krëger as his conceptions coincide with those by Professor M. A. Bezborodov, I. D. Tykachinskiy and others, and he constructs the nomogram on the basis of his data. (See table). Temperatures of 1450-1500° were assumed as to dominate in the practice of industrial glass melting (Table 1). For the calculation of the specific heat consumption that temperature is taken as heating temperature at which the glass mass is

Card 1/3

Nomogram for the Determination of the Specific Heat Consumption in Glass Melting

entering the cooling and working zone. The influence of the factors - the ratio between charge and broken glass, as well as the humidity content of the charge - are described in detail. The elaborated nomogram (see figure) consists of 6 fields and takes into account the ratio between soda and sulfate, the humidity content of the charge, the maximum furnace temperature, the heating of the charge gases, the amount of broken glass and the correction for sodium sulfate. A number of published calculations of the heat consumption in the melting of 1 kg metal is mentioned (Table 2). Then the utilization of the nomogram is described and illustrated by examples. In table 3 the recalculation results carried out by means of the nomogram of earlier published values of the specific heat consumption in the melting of various kinds of glass is mentioned. By means of this nomogram the exact values of the specific heat consumption can be obtained on different conditions. This way the degree of the efficiency of various ash furnaces can be compared. There are 1 figure, 4 tables, and 8 references, 5 of which are [illegible].

SOV/72-58-8-4/17

Nomogram for the Determination of the Specific Heat Consumption in Glass Melting

1. Galss--Melting 2. Heat--Measurement 3. Nomographs--Preparation

Card 3/3

AUTHOR: Stepanenko, M. G. SOV/72-58-9-1/2o

TITLE: The Efficiency of Glass Melting Tank Furnaces (Koeffitsiyent poleznogo deystviya vannykh steklovarennykh pechey)

PERIODICAL: Steklo i keramika, 1958, Nr 9, pp 1 - 3 (USSR)

ABSTRACT: The efficiency of pot and tank furnaces is usually computed according to the following formula

$$\eta = \frac{Q_{utilized}}{Q_{applied}} \cdot 100$$ where $Q_{applied}$ denotes the entire heat content of the fuel burned in the furnace, and $Q_{utilized}$ denotes the amount of heat required for the melting of the batch. For the computation of $Q_{utilized}$ no customary method is established. Hence the results obtained by different authors vary, as it is corroborated by the papers by V.A.Kuzyak, A.A.Sukhov, D.B.Ginzburg and M.G.Stepanenko (Ref 1). The Soviet scientists V.G.Gutop, D.B.Ginzburg as well as foreign ones found that the conception of $Q_{utilized}$ as denoting only the

Card 1/3

amount of heat required for the melting of the glass is erroneous. They, however, abstained from giving a precise definition of this quantity and thus did not make possible a determination of the true value of the efficiency η. According to Professor I.I.Kitaygorodskiy (Ref 1) the reaction of glass formation of commercial glass types proceeds according to information given in the table. It can be seen that the de-gasification of the melt requires higher temperatures than the melting process proper. The amount of heat consumed in that process must be added to the quantity of $Q_{utilized}$. Thus the efficiency of the furnace is increased as can be seen from the figure. The computation of the heat required for the de-gasification meets with difficulties. On the basis of data published by a number of authors (Maurakh, Udovenko, Ginzburg, Kuzyak, Sukhov) the heat required for de-gasification can be assumed to amount to 50% of the heat of melting. Experiments carried out by the Institut ispol'zovaniya gaza AN USSR(Institute of Gas Utilization AS USSR) and by the Teplotekhnicheskaya laboratoriya GIS(Heat Engineering Laboratory GIS) yielded

the same results. A separate heating of the fining zone permits to reduce the heat consumption. Investigations of furnaces in operation permit to design perfected types of furnaces, in which the melting and the fining zone are run under optimum conditions. The values of $Q_{utilized}$ computed in this way will permit to compare the advantages of different furnace processes in a correct manner and to pass an accurate judgement on them. There are 1 figure, 1 table, and 8 references, 5 of which are Soviet.

ASSOCIATION: Gosudarstvennyy nauchno-issledovatel'skiy institut stekla (State Scientific Research Institute of Glass)

AUTHORS: Krechmar, V. A., Stepanenko, M. G. SOV/72-58-1o-7/18

TITLE: Influence Exerted by Gas Density of the Bricking of the Regenerative System of Glass-Melting Furnaces Upon Their Efficiency (Vliyaniye gazoplotnosti kladki regenerativnoy sistemy steklovarennykh pechey na ikh koeffitsiyent poleznogo deystviya)

PERIODICAL: Steklo i keramika, 1958, Nr 1o, pp 28-3o (USSR)

ABSTRACT: Teplotekhnicheskaya laboratoriya Instituta stekla (Thermal Engineering Laboratory of the Glass Institute) investigated within the last two years a number of glass-melting tank furnaces for the manufacture of sheet-glass. It was found that by premature combustion of gas, by sucking of air of untight bricking the heating power of the gas is reduced by 8-17 %. On the basis of numerous analyses of the composition of generator gas in tank furnaces of the plants Lisichansk, Gor'kiy, Konstantinovka imeni Oktyabr'skaya revolyutsiya the diagram (Fig 1) was established from which the heating power of the gas in the individual cases can be determined. Figure 2 shows the dependence of the burning temperature upon the quantity of excess air in the use of purified gas

Card 1/2

Influence Exerted by Gas Density of the Bricking of the Regenerative System of Glass-Melting Furnaces Upon Their Efficiency

in Gor'kovskiy stekol'nyy zavod (Gor'kiy Glass Works) as well as of gas not purified in Bytoshevskiy stekol'nyy zavod (Bytosh Glass Works). In order to obtain a certain temperature level in the furnace, more gas must be added, thus increasing the fuel consumption (Fig 3). These deficiencies were observed in all furnaces examined by the Glass Institute. In order to eliminate these deficiencies it is necessary to seal the joints in the brick work as described in the papers of Nokhratyan. At present, D. B. Ginzburg, M. A. Matveyev (MKhTI) are carrying out experiments with a new sealing plaster in the plant imeni Gor'kiy. The fuel consumption of the furnace is reduced by sealing of the walls, thus increasing the output of the furnace considerably. There are 3 figures.

15(2)
AUTHOR: Stepanenko, M. G. SOV/72-58-12-3/23

TITLE: Gas-Electric Tank Furnaces for Glass Melting (Gazo-elektricheskiye steklovarennyye vannyye pechi)

PERIODICAL: Steklo i keramika, 1958, Nr 12, pp 8 - 13 (USSR)

ABSTRACT: As an example of such installations, the author describes the furnaces of the Karkula factory (Finland), featuring a combined oil and electric heating system. (Figs 1,2 and 3). The latter is effected by means of special air atomizers and molybdenum electrodes. The working temperature of the furnaces amounts to 1530 - 1550° (crystallizing range) and 1450° (feeding range). Figures 4 and 5 show the arrangement of the electrodes. Further, the fuel consumption in the furnaces and the current density of the electrodes are indicated and described as being too high for molybdenum electrodes, according to the paper by E.V.Borel' (Ref 1). In figure 6 the electrodes are distributed in such a way as to secure their symmetrical performance; the author assumes the

Card 1/3

operation of the electrodes to be individually controlled. The table shows the specific heat consumption, depending on the specific output at a tank surface of 20 m^2; in figure 7 this dependence is represented graphically. In conclusion the author states that gas-electric furnaces represent a progressive furnace type and that it would be therefore useful to adopt them in the glass industry of the USSR for the manufacturing of piece products. The construction of such furnaces must be sped up in the Moldavskaya SSR. At the Gor'kovskiy stekol'nyy zavod (Gor'kovskiy glassworks) the changing over of a large furnace producing 140-160 t sheet glass a day to the gas-electric heating system is to be effected. As no experience in this connection has yet been made, the performance of these furnaces is to be thoroughly investigated, in order to obtain the prerequisites for the quickest possible charging over of other sheet glass producing furnaces. Measures must also be taken, in order to secure the production of molybdenum electrodes in the USSR. There are 7 figures, 1 table and 1 Soviet

Gas-Electric Tank Furnaces for Glass Melting SOV/72-58-12-3/23

reference.

Card 3/3

STEPANENKO, M.G.

25(1),25(5) SOV/72-58-12-21/23

AUTHOR: None Given

TITLE: Conference of Functionaries of the Glass Industry
(Soveshchaniye rabotnikov stekol'noy promyshlennosti)

PERIODICAL: Steklo i keramika, 1958, Nr 12, pp 45-46 (USSR)

ABSTRACT: The conference of functionaries of the glass industry of the RSFSR
was held in the town of Vladimir from October 21-23, 1958. The or-
ganizing bodies were: Gosudarstvennyy nauchno-tekhnicheskiy komitet
Soveta Ministrov RSFSR (Scientific-Technical State Committee of the
Council of Ministers of the RSFSR), Gosplan RSFSR (State Office for
Economic Planning of the RSFSR), Vsesoyuznoye khimicheskoye obshchest-
vo imeni D.I. Mendeleyeva (All-Union Chemical Society imeni D.I.Men-
deleyev) and Vladimirskiy sovnarkhoz (Vladimir Council of National
Economy). The topic of the conference was: Perfection of production
processes, introduction of general mechanization and automatic control
in the factories for building and technical glass, glass fiber, glass
containers and vessels. A.I.Boldyrev, Deputy Chairman of the Scienti-
fic-Technical State Committee of the Council of Ministers of the
RSFSR, in his opening speech termed the elaboration of measures for
further development of the glass industry by introduction of the
latest technical achievements as well as the experience of leading
factories to be the most important task. He stressed that the achieve-
ments of Soviet and foreign science and engineering should be con-
sidered in planning new works. The following reports were given:

Card 1/5

M.G.Stepanenko, Professor, Director of the laboratoriya Instituta
Stekla (Laboratory of the Glass Institute), reported on the intro-
duction of electric and gas-electric furnaces.
I.D. Tykachinskiy, Director of the Laboratory of the Glass Institute,
spoke on methods and experiments of intensifying the glass melting
process by increasing the melting temperature and using chemical
accelerators.

Card 2/5

N.V. Solomin, Professor, Director of the Laboratory of the Glass
Institute, spoke on measures of supplying the glass industry with
high-grade refractory products.
D.S. Mitman, Chief Engineer of the Podol'skiy ogneupornyy zavod
(Podol'skiy Factory of Refractory Products) spoke on the manufacturing
technology and the properties of refractory products of this factory.
A.G. Minakov, Deputy Chief Engineer of the Konstantinovskiy zavod
"Avtosteklo" (Konstantinovskiy Works "Avtosteklo") reported on ex-
periments of extension of the furnace working period by artificial
cooling of the furnace brick lining.
V.O. Gusep, Director of the Laboratory of the Glass Institute, report-
ed on the development in automatic control of working conditions for
glass melting furnaces.
V.V. Kriksnits, Deputy Chief of the Otdel stroitel'nykh materialov
Gosstroya SSSR (Section for Building Materials of the Gosstroy SSSR),
spoke on the demands of building experts to the glass industry.
D.I.Alegg, Chief Engineer of the Gusevskoy stekol'nyy zavod imeni
Dzerzhinskogo (Gusevskoy Glassworks imeni Dzerzhinskiy), reported on
the operation of tank furnaces in this factory.
The work of the conference was done in 4 sections: building and tech-
nical glass, vessels, glass containers, glass fiber and glass plastics.

Card 3/5

VILNIS, K.K.; POLLYAK, V.V.; STEPANENKO, M.G.

Most satisfactory temperature conditions for the melting end of glass tank furnaces. Stek. i ker. 15 no.4:1-5 Ap '58. (MIRA 11:5)

1. Institut stekla.

(Glass furnaces)

SOV/72-59-3-3/19

15(2), 15(6)
AUTHORS: Vilnis, K. K., Stepanenko, M. G.

TITLE: Heat Exchange Between the Charge and the Hearth of the Glass Melting Furnace(Teploobmen mezhdu shikhtoy i plamennym prostranstvom steklovarennoy pechi)

PERIODICAL: Steklo i keramika, 1959, Nr 3, pp 8 - 11 (USSR)

ABSTRACT: The authors state that data contained in publications are very contradictory with respect to the dependence of the melting rate of glass as well as the furnace efficiency on temperature (Figs 1 and 2), and are therefore not a reliable basis for the intensification of the melting process in tank furnaces. Relatively few investigations have so far been carried out in the field of heat exchange research (D. B. Ginzburg, Ref 1). The present paper offers an explanation of heat exchange between the upper furnace structure, the charge, and the charge foam in the melting region, basing on K. K. Vilnis' paper (Ref 2). Figure 3 shows the dependence of temperature of the charge surface on the magnitude of

Card 1/2

the heat current flowing onto it, and figure 4 depicts the heat amount absorbed by the charge. Figure 5 gives the variations of temperature in every point of the charge surface. The heat amount absorbed by the melting zone depends, firstly, on the ratio of the areas occupied by the charge and the charge foam, and secondly, on the magnitude of the absolute temperature in the upper structure. The efficiency increase of tank furnaces for glass melting is not only brought about by providing high temperatures, but also by the rational exploitation of the heat exchange both in the gas zone and in the glass mass. Further accurate investigations are required for this purpose. There are 5 figures and 4 references, 3 of which are Soviet.

15(2)
AUTHORS: Stepanenko, M. G., Pavlov, V. S. SOV/72-59-4-2/21

TITLE: On the Effect of a Blocking Device on the Thermal Balance of the Cooling Part of a Tank Furnace (Vliyaniye zagraditel'nogo ustroystva na teplovoy balans studochnoy chasti vannoy pechi)

PERIODICAL: Steklo i keramika, 1959, Nr 4, pp 6-11 (USSR)

ABSTRACT: For the purpose of increasing the specific output of metal, the melting temperature of the furnace must be increased. Since the working temperature of the glass mass must, however, remain unchanged in this case, the processing part of the furnace had to be screened off. However, it was found in this connection that the temperature of the flow of the glass mass to be processed was considerably lower. Since nothing else had been changed in the design of the furnace this could only be explained by the introduction of the lower colder glass mass into the flow to be processed which was confirmed by temperature measurements performed by the teplotekhnicheskaya laboratoriya Instituta stekla (Heat Engineering Laboratory of the Glass Institute) and foreign investigations (Ref 1). This might, however, cause deterioration of the quality of the glass mass. For this reason, investigations had to be carried

Card 1/3

out in order to find a design of screening which would guarantee an increased output of glass mass without a deterioration of the quality. In figures 1,2,3, and 4 the different types of furnaces with and without shuttle are shown and discussed. The velocity of the upper layer of the glass mass was determined by using floats and the amount of the convection currents by using the A. A. Sokolov formula (Ref 2). In table 1 the technical and operational characteristics of the furnaces investigated are given and table 2 gives the thermal balances of the cooling parts of the tank furnaces. In table 3 the balance of the glass mass in the range of the blocking devices of the furnaces is given. Maximum specific temperature drops may be observed in tanks with deeply immersed shuttles and low screens. This explains the opinions expressed by I. I. Tukh and M. B. Epel'baum (Ref 3). In table 4 the thermal balances of the flow to be processed in the range of the screening device of the furnaces investigated are given. Figure 5 shows the dependence of the output of first-quality glass on the coefficient of the introduction of the metal. The investigations carried out of the furnace output as well as the operational

On the Effect of a Blocking Device on the Thermal Balance of the Cooling Part of a Tank Furnace

SOV/72-59-4-2/21

and technical values are considered to be a beginning of the investigations of a screening device which makes it possible to find an optimum design and optimum operational conditions for increasing the fusibility of the tank furnaces without risks. The influence exercised by the blocking device on the quality of the production must also be thoroughly investigated. There are 5 figures, 4 tables, and 4 references, 3 of which are Soviet.

Card 3/3

PHASE I BOOK EXPLOITATION SOV/5484

Stepanenko, Mikhail Georgiyevich

Puti sovershenstvovaniya vannykh steklovarennykh pechey (Ways of Improving Vat Glass Furnaces) Moscow, Gosstroyizdat, 1960. 160 p. Errata slip inserted. 2,200 copies printed.

Sponsoring Agency: Gosudarstvennyy nauchno-issledovatel'skiy institut stekla.

Ed. of Publishing House: S. A. Gladysheva; Tech. Ed.: L. A. Gerasimuk.

PURPOSE: This book is intended for glass technologists.

COVERAGE: The book describes reverberatory, electric, and gas-and-electric vat furnaces for the manufacture of glass. Heating methods, fuel supply, heat distribution, heat exchange, work space arrangement, and the effect of partition structures on the operational efficiency of these in large industrial furnaces are discussed. Recommendations are made for improvements in the design and construction of special purpose vat glass furnaces. The

Card 1/3

author thanks I. O. Tomashevich and V. V. Pollyak, Candidates of Technical Sciences; K. K. Vilnis, Scientific Worker; V. S. Pavlov, Aspirant; and V. D. Soskova, Junior Scientific Worker. There are 84 references: 56 Soviet, 20 German, and 8 English.

TABLE OF CONTENTS:

PATRIN, P.A.; inzh.; KISHENEV, V.F.; TSIPENYUK, M.I., inzh.; VOZNESENSKIY, A.A., kand.tekhn.nauk; SEDOV, V.G., LUR'YE, M.S.; STEPANENKO, M.G., prof.

Over-all mechanization and automatization of the heat treatment of ceramic stones (comment on M.I. Rogovyi's and D.O. Konovalov's article). Stroi. mat. 6 no.3:25-27 Mr '60. (MIRA 13:6)

1. Severo-Kavkazskaya nauchno-issledovatel'skaya stantsiya po stroitel'stvu i stroitel'nym materialam (for Patrin). 2. Zaveduyushchiy laboratoriyey tresta karagandastroymaterialy (for Kishenev). 3. Ukrgiprostroymaterialy (for TSipenok). 4. Zaveduyushchiy kafedroy energeticheskogo oborudovaniya i avtomatiki Rostovskogo inzhenerno-stroitel'nogo instituta (for Voznesenskiy). 5. Glavnyy inzhener instituta Rosstromoproyekt (for Sedov). 6. Glavnyy teplotekhnik instituta Rosstromproyekt (for Lur'ye).

(Kilns) (Automatic control)

STEPANENKO, M.G.

"Glass" by N.Kachalov. Reviewed by M.G.Stepanenko. Stek.i ker. 17 no.3:48 Mr '60. (MIRA 13:6)
(Glass manufacture)
(Kachalov, N.)

STEPANENKO, M.G.; PAVLOV, V.S.

Ways of improving the productivity of pot furnaces for plate glass. Stek.i ker. 18 no.8:12-15 Ag '61. (MIRA 14:8)
(Glass furnaces)

MCHEDLOV-PETROSYAN, O.P.; STEPANENKO, I.G.

Electrochemical activation of cements. Dokl. AN SSSR 141 no.1:172-175 N '61. (MIRA 14:11)

1. Predstavleno akademikom N.V.Belovym.

(Cement)
(Electrochemistry)

NOKHRATYAN, Koryun Amazaspovich, kand. tekhn. nauk; STEPANENKO, M.G., doktor tekhn. nauk, prof., nauchnyy red.; NAUMOV, M.M., kand. tekhn. nauk, nauchnyy red.; ROGOVOY, M.I., laureat Gosudarstvennoy premii, nauchnyy red.; KOSYAKINA, Z.K., red. izd-va; RUDAKOVA, N.I., tekhn. red.

[Drying and firing in the structural ceramis industry]Sushka i obzhig v promyshlennosti stroitel'noi keramiki. Moskva, Gosstroizdat, 1962. 602 p. (MIRA 15:12)
(Ceramics) (Building materials)

STEPANENKO, M.G., doktor tekhn.nauk, prof.; PAVLOV, V.S.

Method of calculating tank glass furnaces with developed working end arrangements. Stek. i ker. 19 no.3:1-6 Mr '62. (MIRA 15:3)
(Glass furnaces)

STEPANENKO, M.G., doktor tekhn.nauk, prof.; LIFSHITS, A.V., inzh.; SIMIN, G.F., inzh.

Study of heat exchange in tunnel kilns during the firing of ceramic wall materials. Stroi.mat. 8 no.7:28-30 Jl '62. (MIRA 15:8)

(Ceramics) (Kilns)

VILNIS, [illegible]; STEPANENKO, N.G., doktor tekhn. nauk [deceased]; KAPLAN, A.Yu., inzh.

Optimal depth of furnaces for dark green glass. Stek. i ker. 21 no.1:9-13 Ja '64. (MIRA 17:8)

1. Institut stekla (for Vilnis, Stepanenko). 2. Krasnodarskiy stekol'nyy zavod (for Kaplan).

83579

24.2120
26.2310

S/056/60/038/005/012/050
B006/B070

AUTHORS: Koval'skiy, N. G., Podgornyy, I. M., Stepanenko, M. M.

TITLE: Investigation of Fast Electrons in Strong Pulse Discharges

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 38, No. 5, pp. 1439-1445

TEXT: At first, the authors describe the experimental arrangement and the method of measurement. The apparatus used was essentially similar to the pulse generator used for earlier investigations. The condenser bank consisted of 12 condensers of the type ИМ-3/50 (IM-3/50) with a total capacity of 36 μF. The discharge chamber was of porcelain, and had a length of 1 m and a diameter of 17 cm. During one discharge, the condenser bank supplied up to 45 kv. The discharge chamber was evacuated after each discharge and filled anew with gas (hydrogen, deuterium, or spectrally pure inert gases). The authors (partly in collaboration with others) had observed in earlier studies (Refs. 1-4) the appearance of a hard X-radiation and an acceleration of electrons (up to (300±20)kev for an initial discharge voltage of 40 kv) while investigating controlled

Card 1/4

thermonuclear reactions. Following these studies, the authors investigated the dependence of the maximum electron energy on the parameters of the discharge. The dependence of the limiting energy in the electron spectrum on the pressure of hydrogen in the discharge chamber (in the range $4.10^{-3} \leq p_0 \leq 6.10^{-1}$ torr) was determined by means of a magnetic spectrograph, and is shown in Fig. 1. In the range $2.10^{-2} < p_0 < 1.3 \cdot 10^{-1}$ torr the curve shows a high maximum; the peak value of the electron energy is 295kev. The pressure dependence of the electron energies is analogous to the pressure dependence of neutron yield in discharges in deuterium, but deviates somewhat from the pressure dependence of the intensity of the hard X-radiation. The dependence of the limiting electron energy (E_0) on the initial voltage U_0 was also investigated (for $p_0 = 7.10^{-2}$torr, in H_2). Fig. 2 shows $E_0(U_0)$ in the range $30 < U_0 \leq 45$ kv. E_0 steeply rises with U_0 up to $U_0 = 40$ kv, and then falls. Further, E_0 was determined as a function of the strength of an external magnetic field in the range $0 < H < 150$ oe (Fig. 3). E_0 falls from 300 to 150 kev when the magnetic field increases from 0 to 30 oe; with a further increase of the field, E_0 becomes less

IX

Investigation of Fast Electrons in Strong Pulse Discharges

S/056/60/038/005/012/050
B006/B070

than 50 kev. The radial distribution of the fast electrons accelerated along the discharge axis was studied by means of a special collimator schematically shown in Fig. 4. Fig. 5 shows the radial distributions determined for $p_0 = 7.10^{-2}$ torr and three different thicknesses of the Al filter (30, 54, and 75μ). Electron energies of 80, 110, and 140 kev, respectively, correspond to these thicknesses. The half width of the distribution curve decreases with increasing thickness of the filter. This shows that the non-equilibrium electron group is accelerated in the immediate neighborhood of the axis. Numerical results of the investigations of fast electrons in H_2, D_2, and the inert gases are collected in a table. The investigations led to the conclusion that in high-power pulse discharges there exist two groups of non-equilibrium electrons; the first group having energies of up to 100 kev is accelerated by the electric fields occurring with the pinch effect, while the second group, which has energies of up to 300 kev, is accelerated in the local electric fields resulting from instabilities of the plasma column. The authors thank S. Yu. Luk'yanov for discussions of the results. There are 5 figures, 1 table, and 8 references: 7 Soviet and 1 Italian.

Card 3/4

83579

Investigation of Fast Electrons in Strong Pulse Discharges

S/056/60/038/005/012/050
B006/B070

ASSOCIATION: Institut yadernoy fiziki Moskovskogo gosudarstvennogo universiteta (Institute of Nuclear Physics of Moscow State University)

SUBMITTED: December 19, 1959

Card 4/4

STEPANENKO, M.N.

USSR/Electronics - Radio station operation

Card 1/1 Pub. 133 - 6/16

Authors : Stepanenko, M. N.

Title : Daily operations in a radio station

Periodical : Vest. svyazi 5, 12-13 May 1955

Abstract : A vivid description is presented of the daily operations and activities in a radio broadcasting station. Operation and maintenance of various radio station equipment is described, and names of some employees are given. Illustrations.

Institution : .....

Submitted : .....

KRUK, M.T.; STEPANENKO, M.T.

Testing of a furnace with turbulent composite burners operating on natural gas by means of a chromatoscope. Energ. i elektrotekh. prom. no.1:14-18 Ja-Mr '63. (MIRA 16:5)

1. Yuzhnoye otdeleniye Gosudarstvennogo tresta po organizatsii i ratsionalizatsii rayonnykh elektrostantsiy i setey.
(Furnaces--Testing) (Gas burners--Testing)

POMETUN, G., stolevar; ONISHCHENKO, M., stolevar; STEPANENKO, N., stolevar.

Carrying out the directives of the Congress. Nauka i zhizn' 23 no.6:17-19 Je '56. (MLRA 9:9)

1. Ordena Lenina zavoda "Zaporozhstal'."
(Zaporozhye--Steel industry)

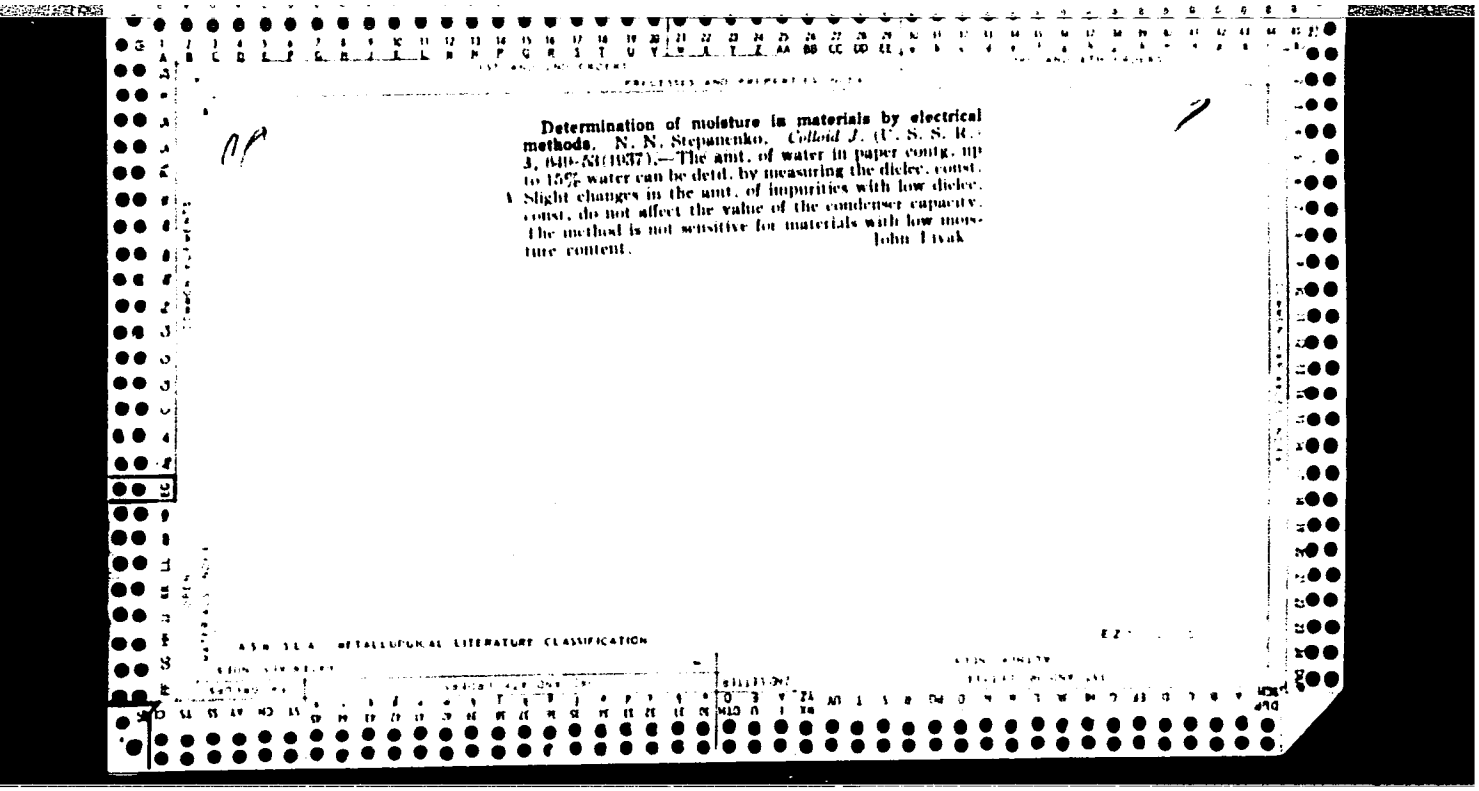
ONISHCHENKO, Mikhail Kirillovich, stalevar; POMETUN, Grigoriy Konstantinovich, stalevar; STEPANENKO, Nikolay Aleksandrovich, stalevar; VERETEL'NIK, I.V., inzhener, redaktor; ISLANKINA, T.F., redaktor izdatel'stva; ISLENT'YEVA, P.G., tekhnicheskiy redaktor

[Our experience with a rapid oxygen steel making process] Nash opyt skorostnogo stalevareniia s primeneniem kisloroda. Moskva, Izd-vo "Znanie," 1953. 23 p. (Vsesoiuznoe obshchestvo po rasprostraneniiu politicheskikh i nauchnykh znanii. Ser. 4 no.6) (MLRA 9:7) [Microfilm]

1. Ordena Lenina zavod "Zaporozhstal'" (for Onishchenko, Pometun, Stepanenko)
(Steel--Metallurgy)

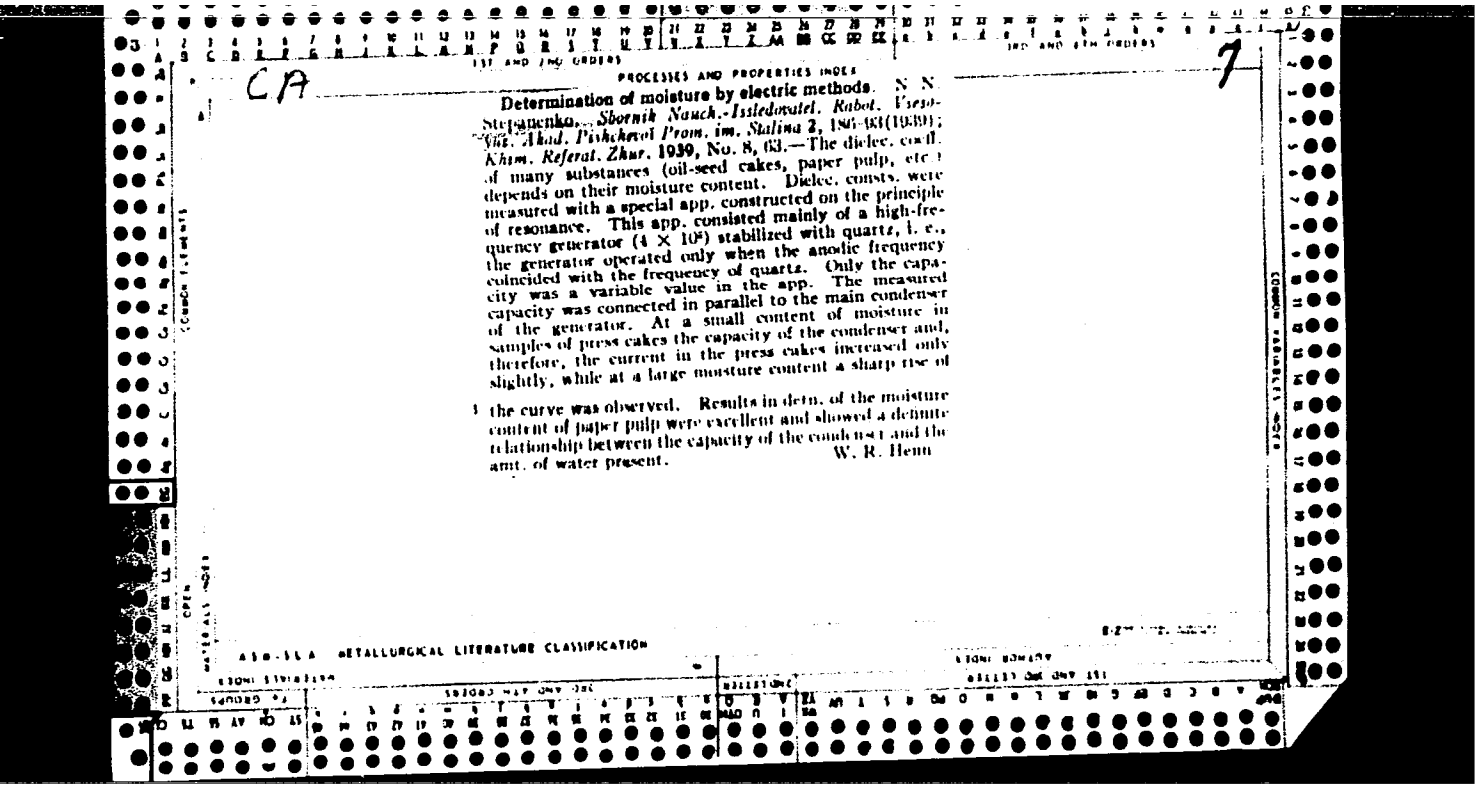
YEREMEYEV, M.N. (Docent) and STEPANENKO, N.D. (Junior Scientific Worker, All.-Union Scientific Research Institute of Animal Raw Material and Fur.)

"The listerosis disease in sables..."
Veterinariya, Vol. 39, no. 3, March 1962 pp. 57



Determination of moisture in materials by electrical methods. N. N. Stepanenko. *Colloid J.* (U. S. S. R.) 3, 649-58(1937).—The amt. of water in paper contg. up to 15% water can be detd. by measuring the dielec. const. Slight changes in the amt. of impurities with low dielec. const. do not affect the value of the condenser capacity. The method is not sensitive for materials with low moisture content.

John Ewak



CA

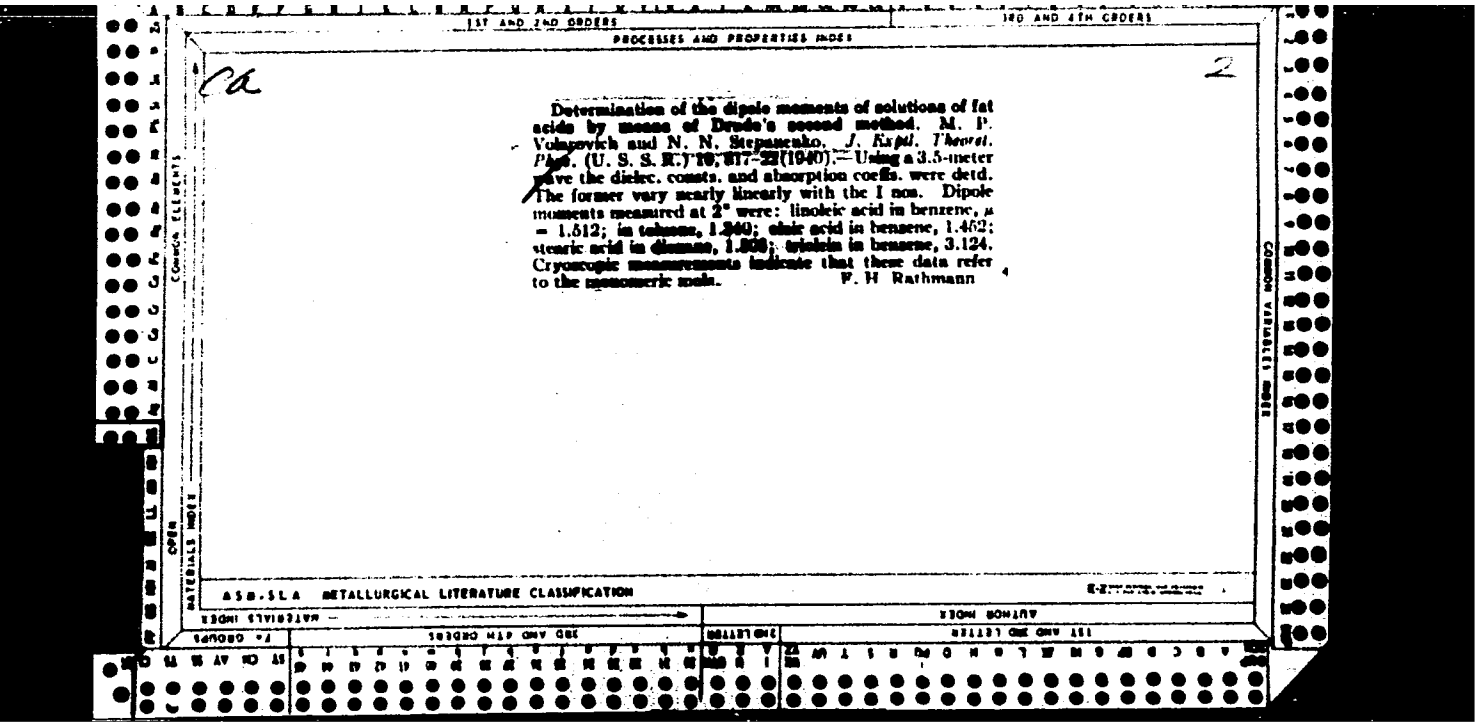
7

PROCESSES AND PROPERTIES INDEX

Determination of moisture by electric methods. S. N. Stepanenko. *Sbornik Nauch.-Issledovatel. Rabot. Vsesoyuz. Akad. Pishchevoi Prom. im. Stalina* 2, 185-93(1939); *Khim. Referat. Zhur.* 1939, No. 8, 63.—The dielec. coeff. of many substances (oil-seed cakes, paper pulp, etc.) depends on their moisture content. Dielec. consts. were measured with a special app. constructed on the principle of resonance. This app. consisted mainly of a high-frequency generator (4×10^8) stabilized with quartz, i. e., the generator operated only when the anodic frequency coincided with the frequency of quartz. Only the capacity was a variable value in the app. The measured capacity was connected in parallel to the main condenser of the generator. At a small content of moisture in samples of press cakes the capacity of the condenser and, therefore, the current in the press cakes increased only slightly, while at a large moisture content a sharp rise of the curve was observed. Results in detn. of the moisture content of paper pulp were excellent and showed a definite relationship between the capacity of the condenser and the amt. of water present.

W. R. Henn

A10-51A METALLURGICAL LITERATURE CLASSIFICATION



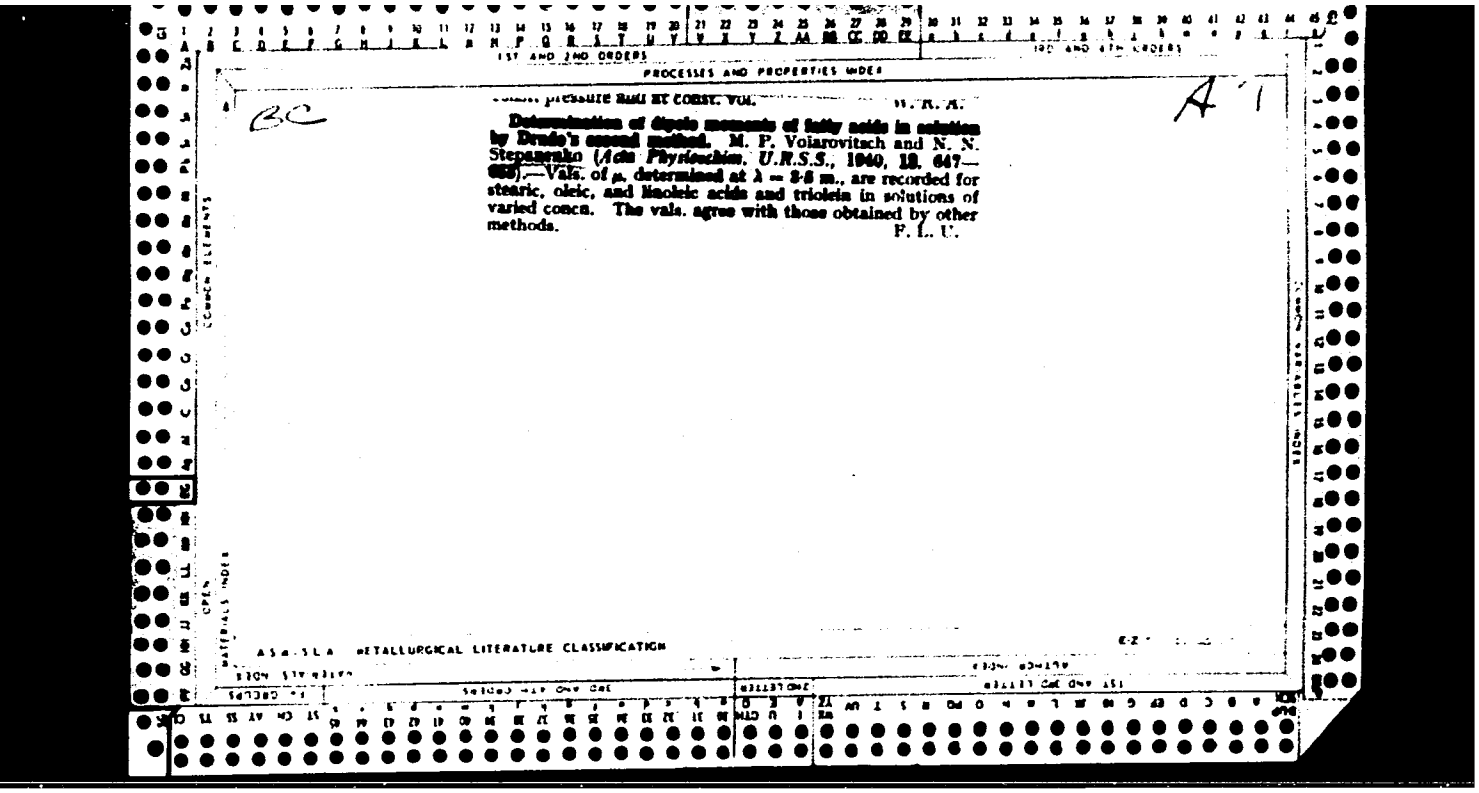
PROCESSES AND PROPERTIES INDEX

Ca

2

Determination of the dipole moments of solutions of fat acids by means of Drude's second method. M. P. Volarovich and N. N. Stepanenko. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 10, 817–22 (1940).—Using a 3.5-meter valve the dielec. consts. and absorption coeffs. were detd. The former vary nearly linearly with the I nos. Dipole moments measured at 2° were: linoleic acid in benzene, μ = 1.512; in toluene, 1.340; oleic acid in benzene, 1.462; stearic acid in dioxane, 1.508; triolein in benzene, 3.124. Cryoscopic measurements indicate that these data refer to the monomeric mols. F. H. Rathmann

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



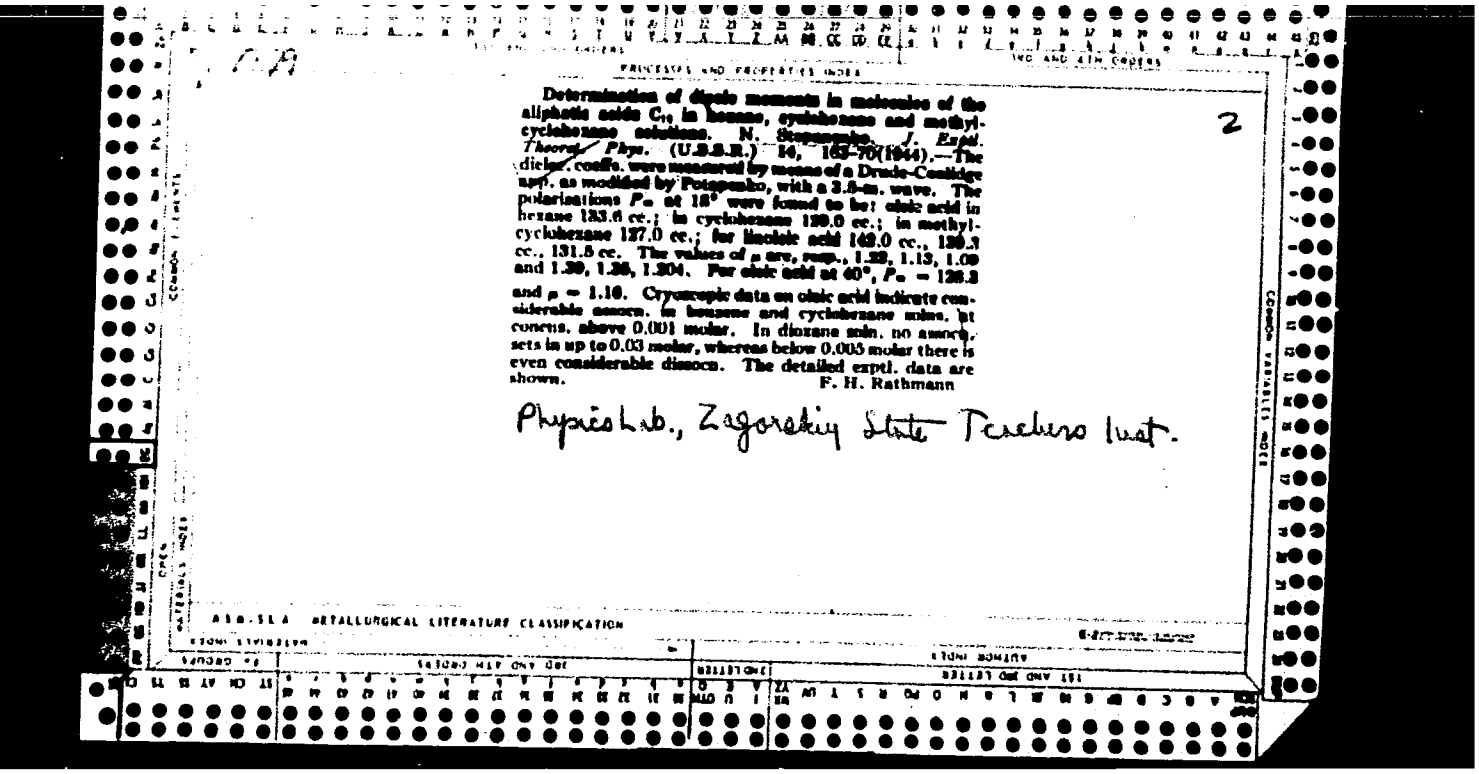
BC

A 1

Determination of dipole moments of fatty acids in solution by Drude's second method. M. P. Volarovitsch and N. N. Stepanenko (*Acta Physiochim. U.R.S.S.*, 1940, **13**, 647—660).—Vals. of μ, determined at $\lambda = 3{\cdot}8$ m., are recorded for stearic, oleic, and linoleic acids and triolein in solutions of varied concn. The vals. agree with those obtained by other methods.

F. L. U.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

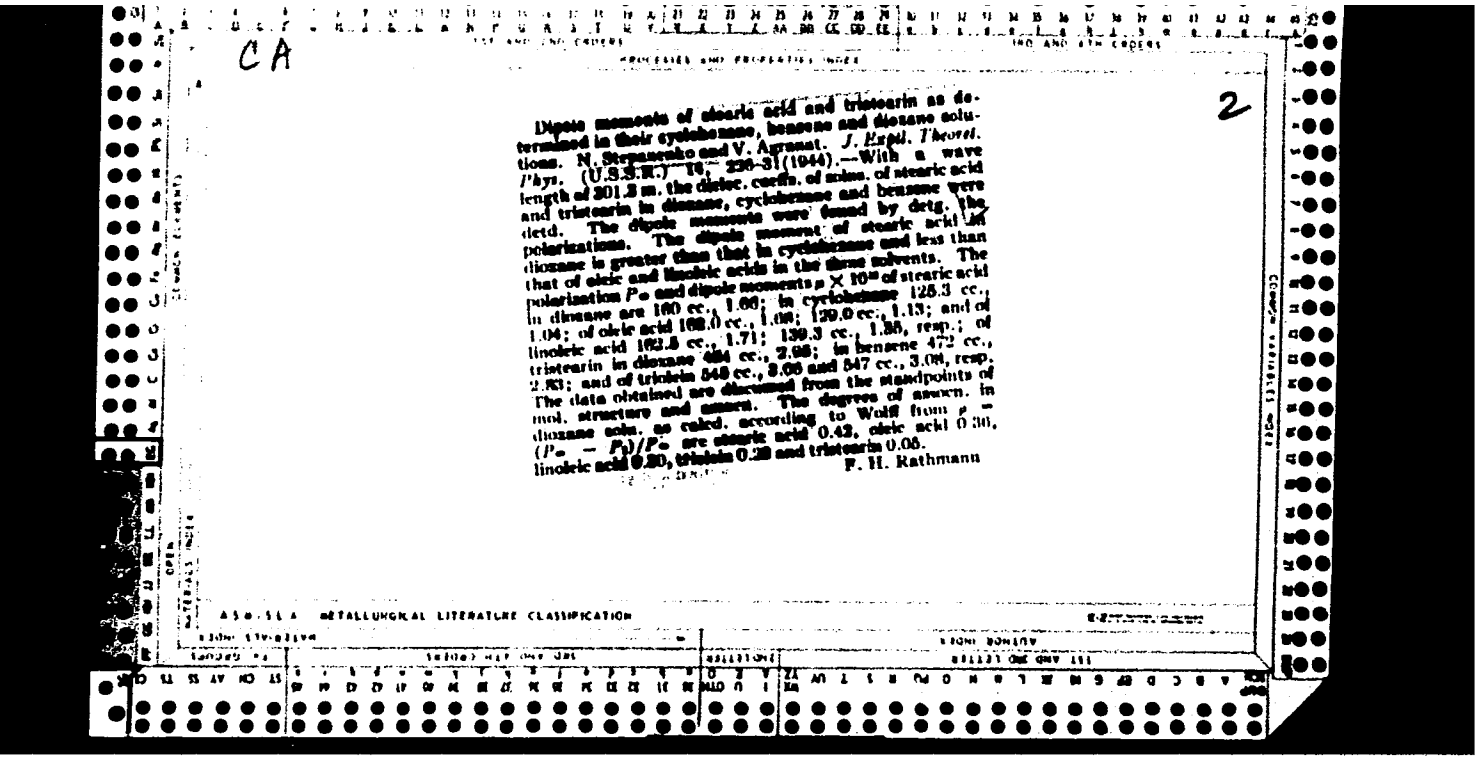


Determination of dipole moments in molecules of the aliphatic acids C_n in hexane, cyclohexane and methylcyclohexane solutions. N. Stepanenko. *J. Exptl. Theoret. Phys.* (U.S.S.R.) 14, 165-70(1944).—The dielec. coeffs. were measured by means of a Drude-Cambige appt. as modified by Potapenko, with a 3.5-m. wave. The polarizations P_∞ at 18° were found to be: oleic acid in hexane 133.6 cc.; in cyclohexane 130.0 cc.; in methylcyclohexane 127.0 cc.; for linoleic acid 140.0 cc., 136.3 cc., 131.5 cc. The values of μ are, resp., 1.32, 1.13, 1.09 and 1.30, 1.26, 1.204. For oleic acid at 40°, P_∞ = 128.3 and μ = 1.16. Cryoscopic data on oleic acid indicate considerable assocn. in hexane and cyclohexane solns. at concns. above 0.001 molar. In dioxane soln. no assocn. sets in up to 0.03 molar, whereas below 0.005 molar there is even considerable dissocn. The detailed exptl. data are shown.

F. H. Rathmann

2

Physics Lab., Zagorskiy State Pedagog Inst.

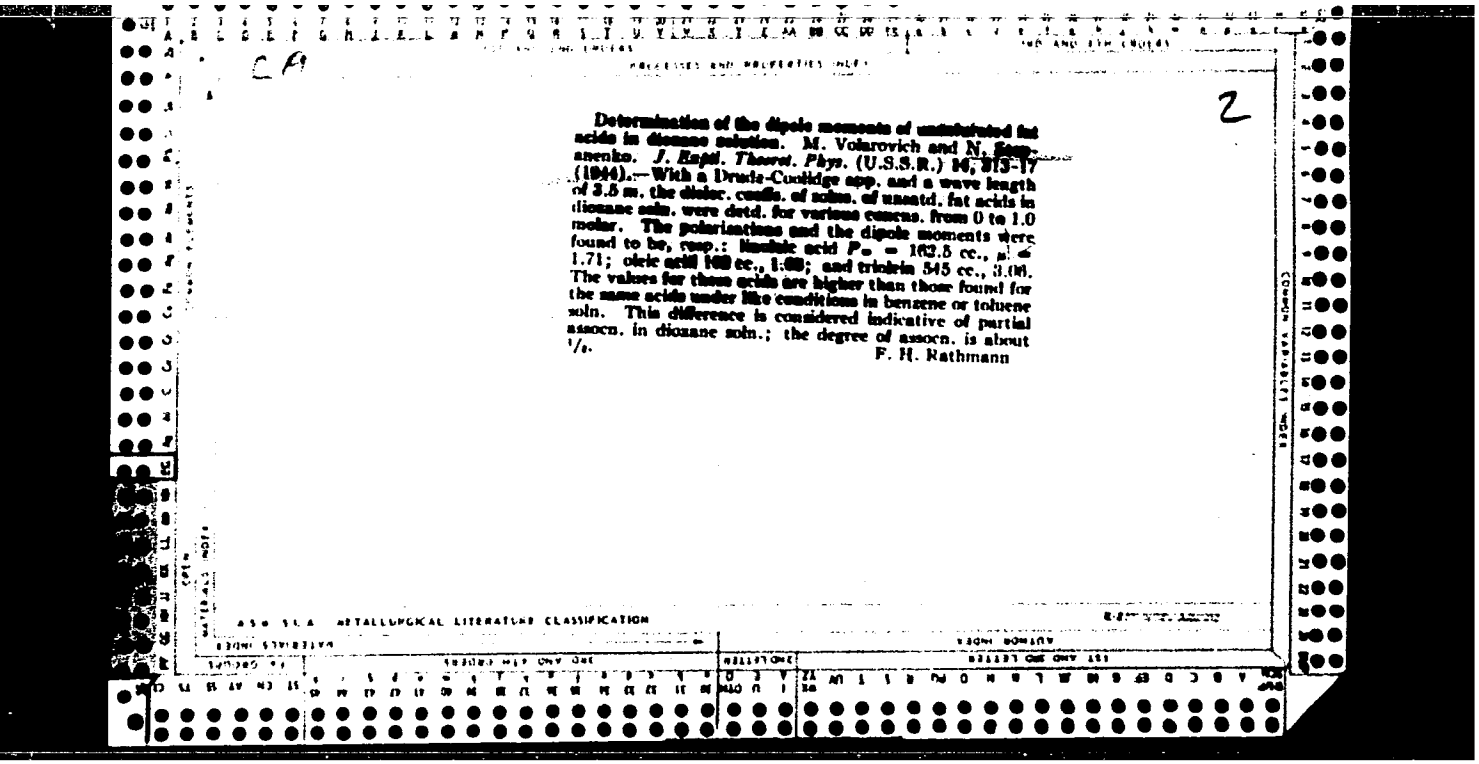


CA

2

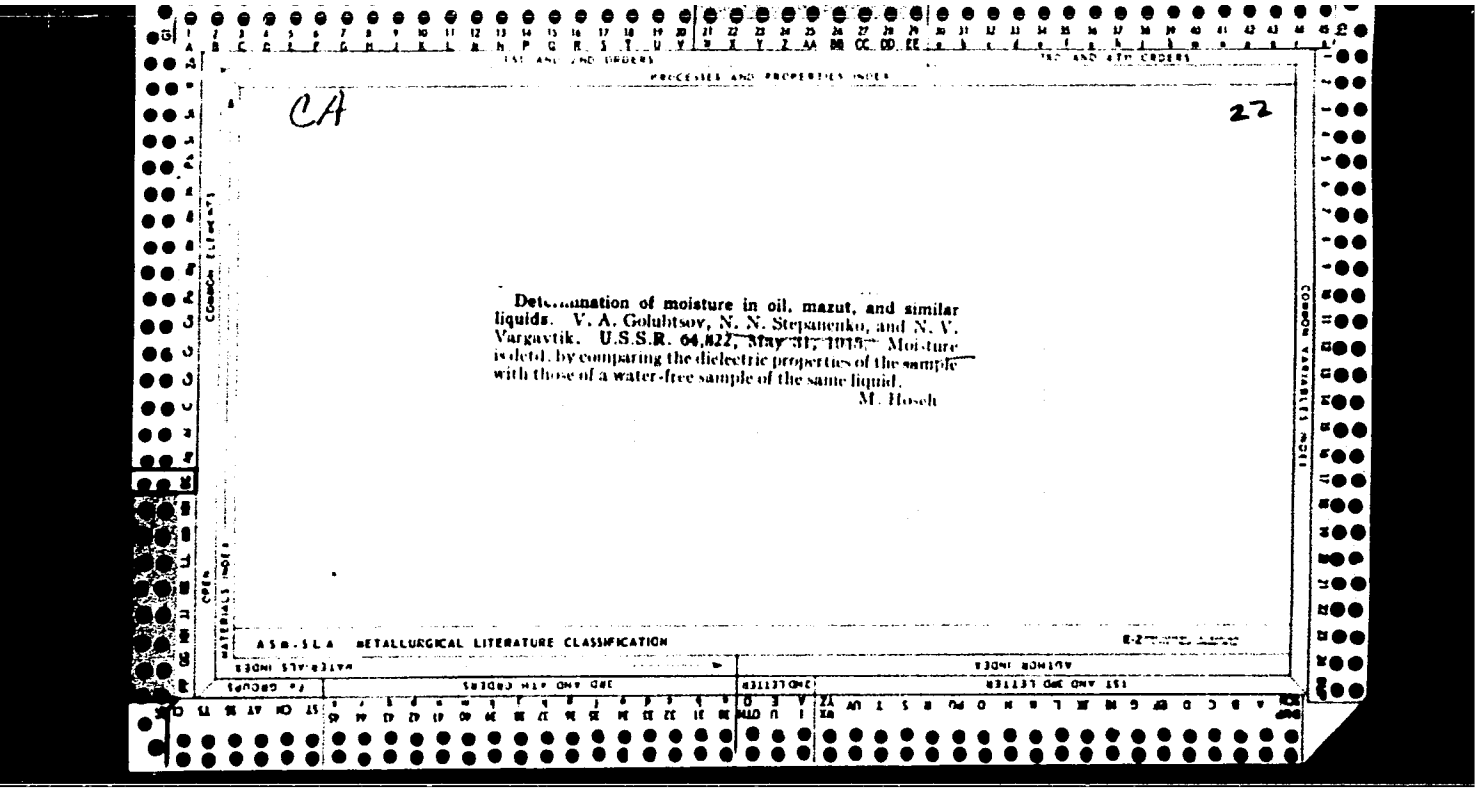
Dipole moments of stearic acid and tristearin as determined in their cyclohexane, benzene and dioxane solutions. N. Stepanenko and V. Agronat. *J. Exptl. Theoret. Phys.* (U.S.S.R.) 14, 236-31(1944).—With a wave length of 301.3 m. the dielec. coeffs. of solns. of stearic acid and tristearin in dioxane, cyclohexane and benzene were detd. The dipole moments were found by detg. the polarizations. The dipole moment of stearic acid in dioxane is greater than that in cyclohexane and less than that of oleic and linoleic acids in the three solvents. The polarization P_∞ and dipole moments $\mu \times 10^{18}$ of stearic acid in dioxane are 160 cc., 1.66; in cyclohexane 125.3 cc., 1.04; of oleic acid 168.0 cc., 1.08; 129.0 cc., 1.13; and of linoleic acid 182.5 cc., 1.71; 139.3 cc., 1.35, resp.; of tristearin in dioxane 484 cc., 2.98; in benzene 472 cc., 2.93; and of triolein 548 cc., 3.09 and 547 cc., 3.08, resp. The data obtained are discussed from the standpoints of mol. structure and assocn. The degrees of assocn. in dioxane solns. as calcd. according to Wolf from $\frac{P_\infty - P_0}{P_\infty}$ are stearic acid 0.43, oleic acid 0.30, linoleic acid 0.20, triolein 0.29 and tristearin 0.06.

F. H. Rathmann



Determination of the dipole moments of unsaturated fat acids in dioxane solution. M. Volarovich and N. Semenenko. *J. Exptl. Theoret. Phys.* (U.S.S.R.) 14, 313-17 (1944).—With a Drude-Coolidge app. and a wave length of 3.5 m. the dielec. consts. of solns. of unsatd. fat acids in dioxane solns. were detd. for various concns. from 0 to 1.0 molar. The polarizations and the dipole moments were found to be, resp.: linoleic acid P_∞ = 162.5 cc., μ = 1.71; oleic acid 160 cc., 1.68; and triolein 545 cc., 3.00. The values for these acids are higher than those found for the same acids under like conditions in benzene or toluene soln. This difference is considered indicative of partial assocn. in dioxane soln.; the degree of assocn. is about 1%.

F. H. Rathmann

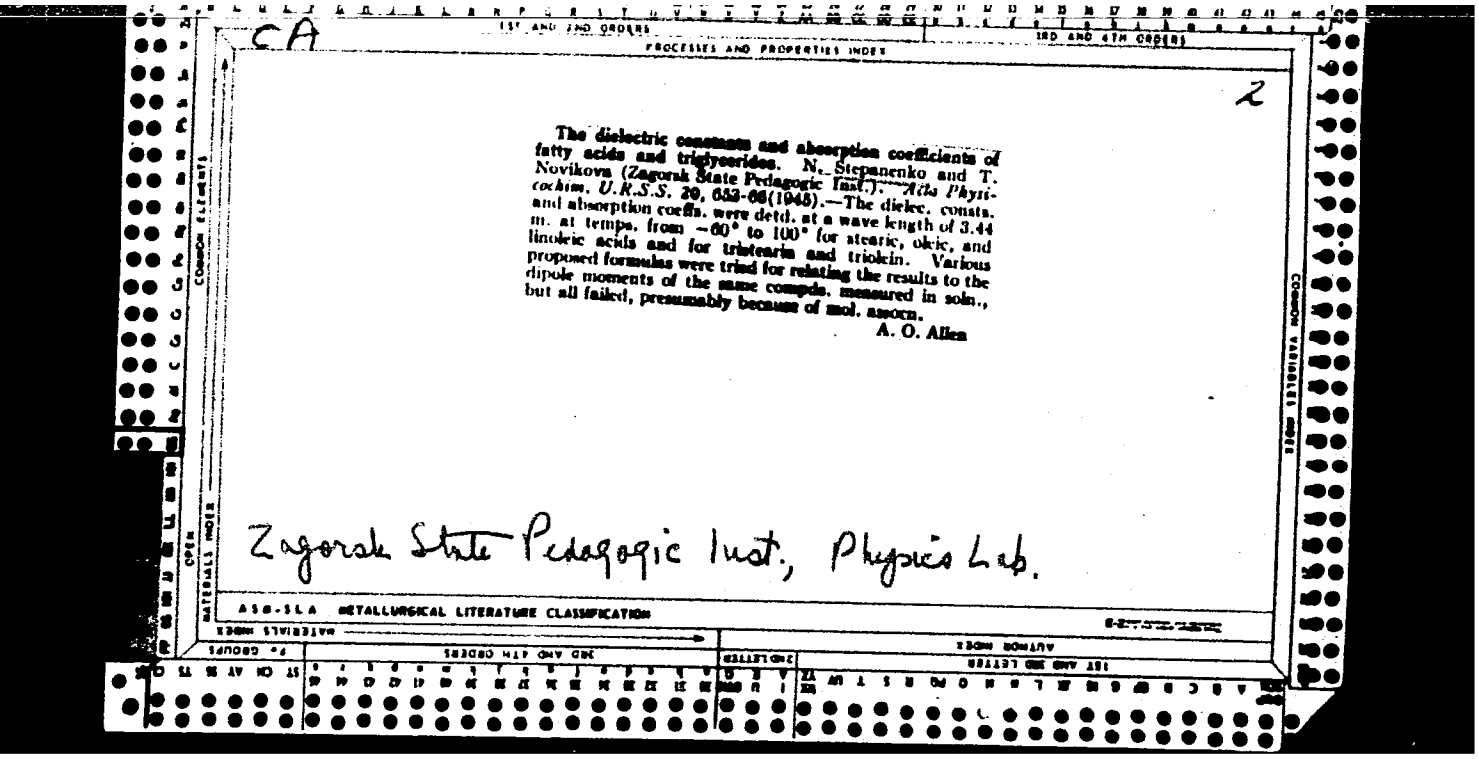


CA

22

Dete...mination of moisture in oil, mazut, and similar liquids. V. A. Golubtsov, N. N. Stepanenko, and N. V. Vargavtik. U.S.S.R. 64,822, May 31, 1945. Moisture is detd. by comparing the dielectric properties of the sample with those of a water-free sample of the same liquid.

M. Hosch



CA

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

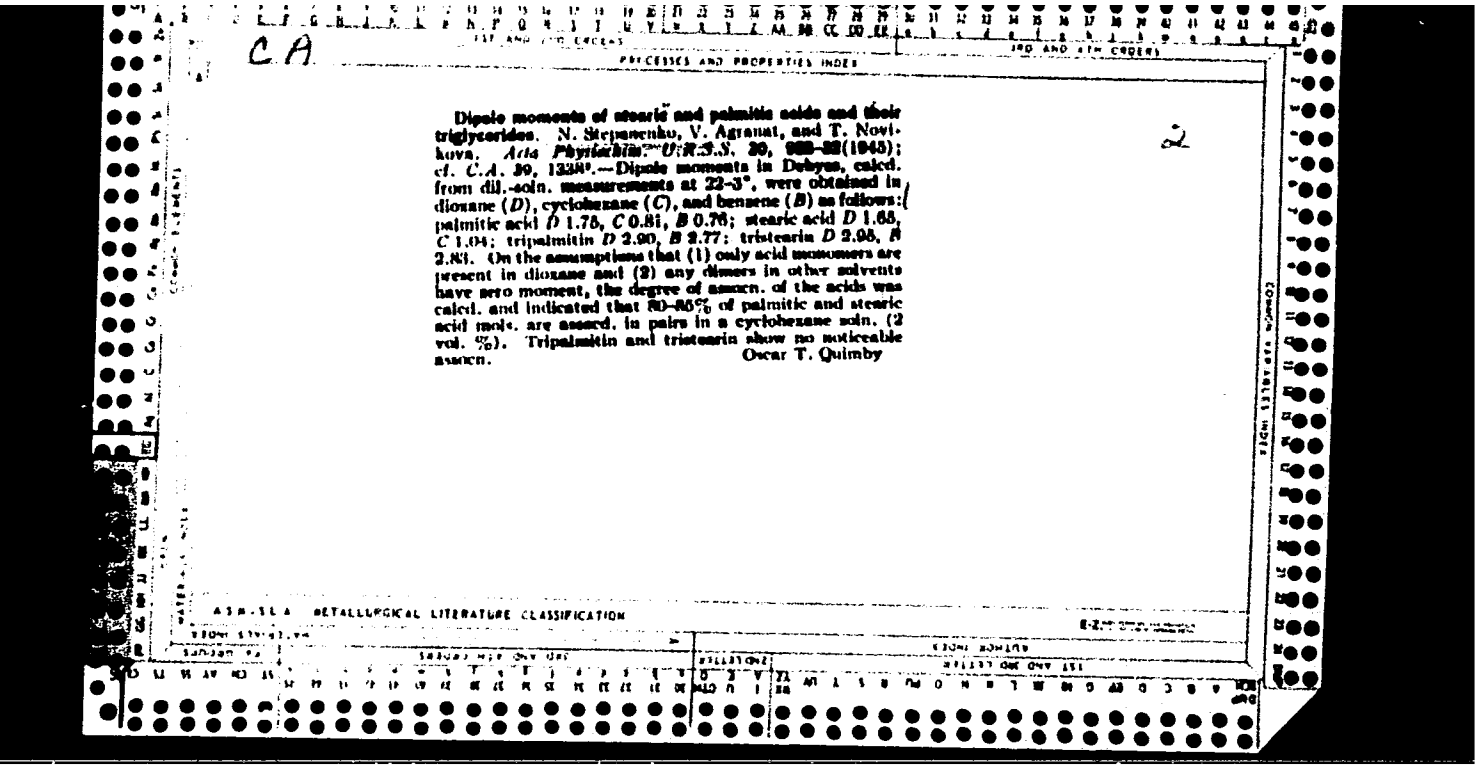
2

The dielectric constants and absorption coefficients of fatty acids and triglycerides. N. Stepanenko and T. Novikova (Zagorsk State Pedagogic Inst.). *Acta Physicochim. U.R.S.S.* **20**, 653-66(1945).—The dielec. consts. and absorption coeffs. were detd. at a wave length of 3.44 m. at temps. from −60° to 100° for stearic, oleic, and linoleic acids and for tristearin and triolein. Various proposed formulas were tried for relating the results to the dipole moments of the same compds. measured in soln., but all failed, presumably because of mol. assocn.

A. O. Allen

Zagorsk State Pedagogic Inst., Physics Lab.

ASG-SLA METALLURGICAL LITERATURE CLASSIFICATION



CA

PROCESSES AND PROPERTIES INDEX

2

Dipole moments of stearic and palmitic acids and their triglycerides. N. Stepanenko, V. Agranat, and T. Novikova. *Acta Physicochim. U.R.S.S.* 20, 929-32(1945); cf. *C.A.* 39, 1338⁹.—Dipole moments in Debyes, calcd. from dil.-soln. measurements at 22-3°, were obtained in dioxane (*D*), cyclohexane (*C*), and benzene (*B*) as follows: palmitic acid *D* 1.75, *C* 0.81, *B* 0.76; stearic acid *D* 1.65, *C* 1.04; tripalmitin *D* 2.90, *B* 2.77; tristearin *D* 2.95, *B* 2.83. On the assumptions that (1) only acid monomers are present in dioxane and (2) any dimers in other solvents have zero moment, the degree of assocn. of the acids was calcd. and indicated that 80–85% of palmitic and stearic acid mols. are assocd. in pairs in a cyclohexane soln. (2 vol. %). Tripalmitin and tristearin show no noticeable assocn.

Oscar T. Quimby

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

STEPANENKO, N. N.

"Dipole Moments of the Palmitic Acid and Tripalmitin Determined in Benzene, Cyclohexane, and Dioxane Solutions," Zhur. eksper. i teoret. fiz., 16, No.6, 1946

Physics Lab., Zagorsk State Pedagogic Inst.

STEPANENKO, N. N.

PA 18T76

USSR/Chemistry - Fatty Acids Jun 1946
Chemistry - Glycerides

"The Dielectric Constants and Absorption Coefficients of Fatty Acids and Triglycerides," N. N. Stepanenko, T. P. Novikova, A. P. Kerman, 8 pp

"Zhur Fiz Khim" Vol XX, No 6

Account of experiments conducted according to the Drude-Coolige method with wave length of 3.44 meters and temperatures of 2 to 3 degrees. Results in graph and tabular form are given for stearic acid, oleic acid, linoleic acid and tristearin.

Zaporak State Teachers College, Moscow

18T76

STEPANENKO, N.N.

VARGAFTIK, N.B.; GOLUBTSOV, V.A.; STEPANENKO, N.N.

[Electrical method of determining moisture content in petroleum products] Elektricheskii metod opredeleniia vlazhnosti nefteproduktov. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1947. 58 p.

(MLRA 7:2)

(Petroleum products)

STEPANENKO, N. N.

PA 34T11

USSR/Chemistry - Electrolytes Feb 1947
Chemistry - Emulsions

"The Influence of the Concentration of Electrolytes in Water Present in Oil, on the Dielectric Constant of the Latter," N. N. Stepanenko, N. B. Vargaftik, M. S. Aref'yev, Physics Laboratory, Institute of Construction, Mossovet, 2 pp

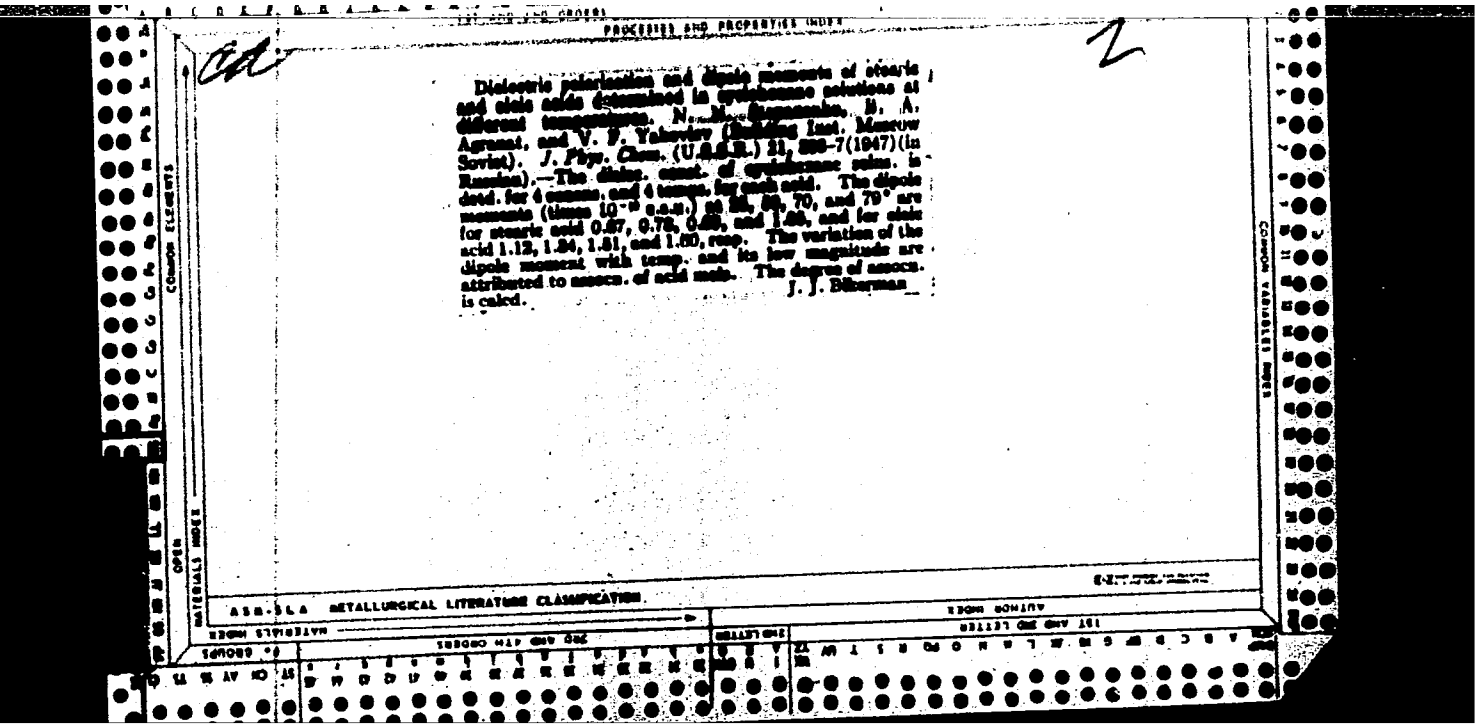
"Kolloidnyy Zhurnal" Vol IX, No 2

Several scientists, among them Frenkel, have advanced the theory that it might be possible to apply Golubtsov's electrical method for determining the moisture content of petroleum products. As a result, the authors describe the experiments which they conducted

USSR/Chemistry - Electrolytes (Contd) Feb 1947

to determine the effect of the concentration of electrolytes in water which is found in oil, and the effect this has on the dielectric constant of the oil. In the experiments the dielectric constant determined the capacity of the condenser.

LC 34T11



PROCESSES AND PROPERTIES INDEX

Dielectric polarization and dipole moments of stearic and oleic acids determined in cyclohexane solutions at different temperatures. N. I. Gapon[illegible], B. A. Agranat, and V. F. Yakovlev (Building Inst., Moscow Soviet). *J. Phys. Chem.* (U.S.S.R.) 21, 699-707(1947)(in Russian).—The dielec. const. of cyclohexane soln. is detd. for 4 concns. and 4 temps. for each acid. The dipole moments (times 10^{-18} e.s.u.) at 30, 50, 70, and 79° are for stearic acid 0.67, 0.76, 0.85, and 1.05, and for oleic acid 1.12, 1.34, 1.51, and 1.60, resp. The variation of the dipole moment with temp. and its low magnitude are attributed to assocn. of acid mols. The degree of assocn. is calcd. J. J. Bikerman

METALLURGICAL LITERATURE CLASSIFICATION

T.

F.A.

941. RAPID MOISTURE CONTENT DETERMINATION [illegible] AT BY [illegible] COEFFICIENT [illegible] Stepanenko, [illegible], [illegible]okopilov, J.E. and [illegible]omolov, M.A. (Tor[illegible]. Pro[illegible]. (Peat Ind.), Dec. 19[illegible]1, 10-12).

STEPANENKO, N. N.

Chemical Abst.
Vol. 48 No. 8
Apr. 25, 1954
Fuels and Carbonization Products

Electric properties of peat. N. N. Stepanenko, I. E. Belokopytov, and N. A. Hogomolov. *Colloid J. (U.S.S.R.)*, 14, 507-9(1952)(Engl. translation).--See *C.A.* 47, 3543b. H. L. H.

STEPANENKO, N.N.; BOGDANOV, L.I.

Dielectric polarization and dipole moment of linolenic acid in benzene and in dioxane. Zhur. Fiz.Khim. 26, 1472-6 '52. (MLRA 5:12)
(CA 47 no.13:6201 '53)

STEPANENKO, N.N.

BOGDANOV, L.I.; STEPANENKO, N.N.

Dielectric constant and absorption coefficients of tripalmitin.
Zhur. Fiz. Khim. 26, 1477-9 '52. (MLRA 5:12)
(CA 47 no.13:6201 '53)

STEPANENKO, N. N.

IA 242T14

USSR/Chemistry - Dioxane Nov 52

"The Dielectric Permeability and the Coefficients of Absorption of Dioxane," N. A. Bogomolov and N.N. Stepanenko, Second State Med Inst, Moscow

"Zhur Fiz Khim" Vol 26, No 11, pp 1664- 665

With an arrangement based on the Drude-Coolidge method, and using waves of 1.5 m and 63.5 cm, the authors measured the dielectric permeability and coeffs of absorption of dioxane and computed the values of its polarization at different temps. The

242T14

data obtained led to the conclusion that dioxane is non-polar. The coeffs of absorption for dioxane appeared equal to zero in the range of temps investigated.

242T14

STEPANENKO, N. N.

Chemical Abst.
Vol. 48 No. 6
Mar. 25, 1954
General and Physical Chemistry

(3)

Dielectric constant and absorption coefficients of linolenic acid. L. I. Bekkedahl and N. N. Stepanenko (Leningrad Pedagog. Inst.). *Zhur. Fiz. Khim.* 27, 1481–4(1953); cf. *C.A.* 47, 6201*f*.—The dielec. consts. ε of linolenic acid are 2.55, 2.76, 2.97, and 3.01 at −10°, 20°, 60°, and 100°, resp. The absorption coeff. is 0.03, 0.07, and 0.08 at −10°, 40–60°, and 80–100°, resp. For stearic, oleic, linoleic, and linolenic acids, ε is a linear function of the iodine no. The Drude-Coolidge method, with 64-cm. waves, was used for the measurements. J. J. Bikerman

11-5-54

STEPANENKO, N.N., professor (Moskva); SOKOLOV, N.A., dotsent (Moskva)

Fiftieth anniversary of the death of Pierre Curie. Fel'd. i akush. 21 no.6:29-32 Je '56. (MLRA 9:9)
(CURIE, PIERRE, 1859-1906)

Stepanenko, N. N.

USSR/Physical Chemistry - Thermodynamics, Thermochemistry, Equilibria, Physical-Chemical Analysis, Phase Transitions. B-8

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3766.

Author : M.M. Popov, Yu.V. Gagarinskiy, N.N. Stepanenko.
Inst :
Title : Dissociation Pressure of $Li_2SO_4 \cdot H_2O$ at 25 to 45°.

Orig Pub: Zh. neorgan. khimii, 1957, 2, No 7, 1457-1459.

Abstract: The dissociation pressure of $Li_2SO_4 \cdot H_2O$ was measured at 25 to 45° with differential tensimeters. The adjusted mean experimental values satisfy the equation logP (mm of merc. col.) = 10.228 - 2967/T. The calculated heat of Li_2SO_4 hydration by liquid water is 3.18 kcal per mole.

Card : 1/1 -15-

BORDIKOVA, A.I., dots., kand.biol.nauk; STEPANENKO, N.N., prof., doktor fiz.-mat.nauk

Remizov frigorimeter and its use in solving certain problems. Nauch.dokl.vys.shkoly; stroi. no.3:274-279 '58. (MIRA 12:7)

1. Rekomendovana kafedroy fiziki Moskovskogo instituta inzhenerov gorodskogo stroitel'stva Mosgorispolkoma.
(Thermometers and thermometry)

STEPANENKO, N.P.

Minutes of the Fifth Meeting of the Kiev Province Scientific Society of Doctors and Otolaryngologists on September 10, 1958. Zhur. ush., nos. i gorl. bol. 19 no.5:93-94 S-O '59. (MIRA 14:10)
(ODESSA PROVINCE--OTOLARYNGOLOGICAL SOCIETIES)

STEPANENKO, N.P.

Minutes of the Sixth Meeting of the Kiev Province Scientific Society of Doctors and Otolaryngologists on October 31, 1958. Zhur. ush., nos. i gorl. bol. 19 no.5:94-96 S-O '59. (MIRA 14:10)
(ODESSA PROVINCE--OTOLARYNGOLOGICAL SOCIETIES)

STEPANENKO, O.R., st. nauchn. sotr., otv. red.; LITVAK, L.B., zasl. deyatel' nauki, prof., zam. otv. red.; MAN'KOVSKIY, B.N., prof., red.; PANCHENKO, D.I., zasl. deyatel' nauki, prof., red.; TATARENKO, N.P., zasl. deyatel' nauki, prof., red.; SOKOLYANSKIY, G.G., prof., red.; GOLUBOVA, R.A., st. nauchn. sotr., red.

[Disorders of cerebral blood circulation (in the neurological clinic)] Rasstroistva mozgovogo krovoobrashcheniia (v nevrologicheskoi klinike). Kiev, Zdorov'ia, 1965. 258 p. (MIRA 18:9)

1. Ukrainskiy nauchno-issledovatel'skiy psikhonevrologicheskiy institut. 2. Ukrainskiy nauchno-issledovatel'skiy psikhonevrologicheskiy institut (for Litvak). 3. Otdel nevrologii Ukrainskogo nauchno-issledovatel'skogo psikhonevrologicheskogo instituta (for Golubova). 4. Otdel vegetativnoy patologii Ukrainskogo nauchno-issledovatel'skogo psikhonevrologicheskogo instituta (for Stepanenko). 5. Kafedra nervnykh bolezney Donetskogo meditsinskogo instituta (for Panchenko).