between 0.1 and 0.82 mm. It was found that the dependence of the thermo e.m.f. on the specific deformation work can be expressed by means of a single general curve for torsion, tension, rolling and cutting. For all these types of deformation, approximately the same induced e.m.f. corresponds to equal deformation work. The assumption that the equivalence of deformation should be evaluated on the basis of equivalence of specific deformation work was confirmed by the thermo e.m.f. method as being valid also for the case of the machining of copper. Measurements of the induced thermo e.m.f. of chip may prove useful for finding generally valid relations inter-linking the process of machining of metals with other well known types of deformation. There are 3 figures.

ASSOCIATION: Chelyabinskiy institut mekhanizatsii i elektrifikatsii sel'skogo khozyaystva (Chelyabinsk Institute of Mechanization and Electrification of Agriculture)

SUBMITTED: April 3, 1961

37069
S/057/62/032/004/015/017
B116/B102

11.6300

AUTHORS: Kunin, N. F., Kunin, V. N., and Grishkevich, A. Ye.

TITLE: Thermal ionization in the gasoline flame

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 4, 1962, 485-487

TEXT: Ionization in the gasoline flame at 1100-1700°K was investigated. The flame resistance was measured perpendicular to the gas current. The air compressed in compressor 1 (Fig. 1) was conveyed to combustion chamber 2 (with 1.05-1.12 atm excess pressure). By compressed air (compressor 6), gasoline Б-70 (B-70) was injected from container 3 into the air conduit between compressor 1 and combustion chamber 2. The flow rate was about 120 m/sec. A transverse magnetic field of up to 7500 oe was generated with electrodes between pole shoes 4. The resulting transverse emf E was taken off by means of graphite plates 5, which were also used to measure the electrical resistance. Automatic electronic potentiometers and bridges with suitable pickups were used to measure the flame temperature T between the plates, the air consumption, G, per second, the gasoline consumption, D_B, per second, and the pressure, p,

Card 1/2

Thermal ionization in the gasoline ...

in the combustion chamber. The resistance, R, of the flame between the plates was found to depend on T as

$$R = CT^{-3/4} e^{\frac{U}{2kT}} \quad (5).$$

C is a constant, and U is the activation energy of ionization. The activation energy was determined from the slope of Eq. (5), which is represented as a straight line. It amounts to 1.09 ev, and is thus closest to the formation and decay energies of negative oxygen ions. There are 3 figures. The most important English-language reference reads as follows: A. Cherman. ARS J., 30, no. 6, 41, 1960.

ASSOCIATION: Chelyabinskiy politekhnicheskiy institut
(Chelyabinsk Polytechnic Institute)

SUBMITTED: January 28, 1961 (initially)
April 5, 1961 (after revision)

GRISHKEVICH, A.Ye.; KUNIN, N.F.

Plastic tension of copper at various speeds and temperatures. Fiz. met. i metalloved. 16 no.3:427-434 S '63. (MIRA 16:11)

1. Belorusskiy gosudarstvenny universitet imeni Lenina, i Chelyabinskiy pedagogicheskiy institut.

KUNIN, N.F.; NILOV, A.S.

Recovery of induced thermal forces in copper deformed at various speeds. Fiz. met. i metalloved. 12 no.6:921-923 D '61. (MIRA 16:11)

1. Chelyabinskiy politekhnicheskiy institut.

KUNIN, N.F.; YURCHENKO, B.D.

Regularities in the packing of powderlike materials. Plast.massy no.6:28-32 '64. (MIRA 18:4)

KUNIN, N.F. (Moskva); YURCHENKO, B.D. (Moskva)

Compressing metal powders. Porosh. met. 4 no.6:1-11 N-D '64.
(MIRA 18:3)

KUNIN, N.F.; KISLYAKOV, S.A.

Dynamic effects of plastic deformation in copper and its alloys. Dokl. AN BSSR 8 no.2:124-126 F '64. (MIRA 17:8)

1. Belorusskiy gosudarstvennyy universitet imeni Lenina. Predstavleno akademikom AN BSSR R.P. Severdenko.

KUNIN, N.F.; KUNIN, V.N.; GRISHKEVICH, A.Ye.; KORENCHENKO, Ye.S.

Energy absorption by copper during small deformations. Fiz. met. i metalloved. 17 no.5:789-792 My '64.

(MIRA 17:9)

1. Belorusskiy gosudarstvennyy universitet imeni Lenina.

L 21300-66 EWP(e)/EWT(m)/EWF(t)/EWP(k) JD

ACC NR: AP6007283 (A) SOURCE CODE: UR/0226/66/000/002/0021/0026

AUTHOR: Kunin, N. F.; Yurchenko, B. D.; Myshkina, N. V.

ORG: Belorussian State University im. V. I. Lenin (Belorusskiy gosuniversitet)

TITLE: Absorption of energy in pressing powder mixtures

SOURCE: Poroshkovaya metallurgiya, no. 2, 1966, 21-26

TOPIC TAGS: energy absorption, solic solution, powder metal, zinc, copper, tin

ABSTRACT: The authors measured the energy absorption in powder mixtures of Cu+Zn and Cu+Sn. The value of the specific energy absorbed increases with compactness, reaches a maximum and the falls. The differential relative absorption varies in the same way. With high compactness the latter value if negative. The maximum specific absorption of energy for mixtures is lower than that for powders made of pure metals. Reduction of absorption is explained by the formation of surface solid solutions in contact regions. The thickness of the films of surface solid solutions, calculated from the reduction absorption and the constants of formation of solid solutions for a 60 to 40 mixture proved to be of the order of one hundredth of a centimeter. Orig. art. has: 6 figures, 2 tables and 4 formulas. [Author's abstract.]

SUB CODE: 11/ SUBM DATE: 25Feb65/ ORIG REF: 005/

Card 1/1

L 33229-66 EWT(m)/EWP(j) IJP(c) JAJ/RM

ACC NR: AP6024587 SOURCE CODE: UR/0314/66/000/003/0024/0027

AUTHOR: Kunin, N. F. (Doctor of physico-mathematical sciences); Yurchenko, B. D. (Doctor of technical sciences)

ORG: none

TITLE: Analytic method of calculating the work of packing powdered plastics

SOURCE: Khimicheskoye i neftyanoye mashinostroyeniye, no. 3, 1966, 24-27

TOPIC TAGS: job analysis, mathematic analysis, plastic

ABSTRACT: The article presents illustrative values of the specific work of packing several powdered materials, measured and calculated by different methods. As shown in a previous study, the relationship between packing pressure p and density of the pellet γ is described by the equation:

$$\gamma = \gamma_{\text{max-dens}} - \frac{k_0}{\alpha} e^{-\alpha p}, \qquad (1)$$

where $\gamma_{\text{max-dens}}$ = given maximum density; k_0 = initial packing coefficient; α = coefficient of compressibility losses; and e = base of natural logarithms. This equation makes it possible to derive an analytical expression for the work of packing. Transforming equation (1) into logarithmic form, and solving it relative to p, we obtain:

$$p = -\frac{1}{\alpha} \ln \frac{\gamma_{\text{max-dens}} - \gamma}{B}, \qquad (2)$$

where $B \frac{k_0}{\alpha}$. Orig. art. has: 7 figures, 9 formulas and 2 tables. [JPRS: 35,728]

SUB CODE: 05, 06, 11 / SUBM DATE: none / ORIG REF: 001 UDC: 678.024.001.24

Card 1/1 pb

0915 2220

L 00650-67 EWT(m)/T/EWP(t)/ETI IJP(c) GD/JD

ACC NR: AT6016346 (N) SOURCE CODE: UR/0000/65/000/000/0104/0109

AUTHORS: Kunin, N. F.; Zhilik, K. K.; Voropayev, A. G.; Samokhval, V. V.

ORG: Belorussian State University im. V. I. Lenin (Belorusskiy gosudarstvennyy universitet)

TITLE: Thermal treatment of silver, copper, and tin vacuum condensates

SOURCE: AN UkrSSR. Podvizhnost' atomov v kristallicheskoy reshetke (Mobility of atoms in crystal lattice). Kiev, Izd-vo Naukova dumka, 1965, 104-109

TOPIC TAGS: ~~thin~~ metal film, silver, copper, tin, metal heat treatment, activation energy

ABSTRACT: The laws for stabilizing the properties of silver, tin, and copper thin films are investigated in order to remove the data scatter in their properties caused by the method of film preparation and to study the nature of the defects present in the freshly deposited films. The films were deposited on a glass substrate at room temperature in a 10^{-4} mm Hg vacuum. After deposition, the metal films were spontaneously aged at room temperature for 50 hrs during which time their resistance decreased gradually. The heat treatment for tin was made at 150C in hydrogen as well as in air, without an irreversible change in its resistance. The heat treatment for silver was at 70--120C and for copper at 150--200C. The results are shown on graphs and tables. Plots are given of resistance versus time, relative change in film resistance versus

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L 00650-67

ACC NR: AT6016346

time, activation energy as a function of temperature, and curves of resistivity versus film thickness. The results show that in freshly deposited silver and copper films there exist many structural defects with widely varying spectra of activation energies. Also, the heat treatment stabilizes the film properties of all three metals. Orig. art. has: 4 formulas, 4 figures, and 2 tables.

SUB CODE: 11/ SUBM DATE: 10Nov64/ ORIG REF: 003/ OTH REF: 002

Card 2/2 pb

ACC NR: AR6033777 SOURCE CODE: UR/0058/66/000/007/G014/G014

AUTHOR: Kunin, N. F.; Nechayev, V. I.

53

TITLE: Relationship between current and reaction in point discharge

SOURCE: Ref. zh. Fizika, Abs. 7G106

REF SOURCE: Tr. Chelyab. in-ta mekhaniz. i elektrifik. s. kh., vyp. 22, 1965, 103-111

TOPIC TAGS: ionized gas, current, reactive force, point discharge space, ionized gas flow, electric current, twist angle, momentum

ABSTRACT: A study was made of the reactive force as a function of current in a point discharge in gas. A pair of points was mounted on a rigidly fixed axis and the angle of twist produced by the reactive force of the momentum was measured. The experiments were conducted by varying the pressure, the type of gas used, the intensity, and the geometric configuration of the points. The relationship between the reactive force and the current in all cases was found to be close to linear. The ratio was found to depend on the conditions of the experiment: according to the authors, this relationship may be qualitatively explained within the framework of their

L 09384-67

ACC NR: AR6033777

simple model of ionized gas flow in a discharge space. A. Kadymov. [Translation of abstract]

SUB CODE: 20/

Card 2/2 mle

SOLOVOV, A.P.; KUNIN, N.Ya.

Metallometric surveying of dispersion halos in mountainous areas. Sov.geol. 3 no.5:32-46 My '60.
(MIRA 13:7)

1. Kazakhskiy geofizicheskiy trest Ministerstva geologii i okhrany nedr Kazakhskoy SSR.
(Geological surveys) (Ore deposits)

KUNIN, N.Ya.

Tectonics and gas and oil potentials of the southwestern Chu-Sary-Su Depression. Izv. AN Kazakh. SSR. Ser. geol. no.2:3-17 '61. (MIRA 14:7)

(Chu Valley--Petroleum geology)
(Chu Valley--Gas, Natural)
(Sary-Su Valley--Gas, Natural)
(Sary-Su Valley--Petroleum geology)

KUNIN, N.Ya.

Analysis of the distribution of Mesozoic and Cenozoic thicknesses in the depression in the middle of the Syr Darya Valley based on geophysical data. Izv.AN Kazakh.SSR.Ser.geol. no.4:26-35 '62. (MIRA 15:7)

(Syr Darya Valley--Petroleum geology)
(Syr Darya Valley--Gas, Natural--Geology)

KUNIN, N. Ya.

Method for the objective evaluation of the gravitational field in a qualitative interpretation; a topic for discussion. Izv. AN Kazakh. SSR. Ser. geol. nauk no.5:96-102 '63. (MIRA 17:1)

1. Turlanskaya geofizicheskaya ekspeditsiya, g. Chimkent.

KUNIN, N.Ya.

New data on the tectonics of the southwestern section of the Chu-Sarysu Depression. Neftegaz. geol. o geofiz. no.8:49-52 '63. (MIRA 17:3)

1. Turlanskaya geofizicheskaya ekspeditsiya.

KUNIN, N.Ya.; MIKHEYEVA, I.G.

Using variation curves in establishing a law for the change with depth in effective velocity. Razved. i prom. geofiz. no.47: 29-34 '63. (MIRA 16:8)

(Seismometry)

ACCESSION NR: AT4016748 S/2604/63/000/049/0094/0100

AUTHOR: Kunin, N. Ya.; Davy*dov, N. G.

TITLE: The accuracy of gravimetric prospecting and the sources of error

SOURCE: Moscow. Vses. n.-i. inst. geofiz. metodov razvedki. Razvedochnaya i promy*slovaya geofizika (Prospecting and industrial geophysics), no. 49, 1963, 94-100

TOPIC TAGS: gravimetric prospecting, probability theory, error source, gravimetry, prospecting

ABSTRACT: The article discusses and compares the errors in highly-accurate and double milligal prospecting. Analysis of a 167-point sample shows that the large errors in determining anomalies of gravity (1.3 milligal) are not caused by inadequacy of the formulas used for estimating accuracy, but by incorrect methods of prospecting and checking. The authors suggest that a similar analysis should be performed in other places where prospecting of higher accuracy is performed. In order to determine the accuracy of measurements, repeated observations are made, and the accuracy of interpolation is determined. A comparison of the results of

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ACCESSION NR: AT4016748

double-milligal and accurate gravimetric prospecting allows one to estimate the quality of the first and to analyze the observational errors. During this comparison, the mean square error in the anomalies can be found and interpolated by the gravimetric map. These errors show the quality of operations and the accuracy of the plotted map. Errors in observation of more than 1.5 milligal are connected with measurements of over 3 hours and to the use of a zero point of over 0.75 milligal/hr. Observations should therefore not exceed two hours, and errors at the zero point should not be over 0.75 milligal per hour. Orig. art. has: 7 figures and 3 equations.

ASSOCIATION: Vses. n.-i. inst. geofiz. metodov razvedki, Moscow (All-Union Scientific Research Institute of Geophysical Prospecting)

SUBMITTED: 00

DATE ACQ: 13Feb64 ENCL: 00

SUB CODE: ES

NO REF SOV: 000 OTHER: 000

Card 2/2

KUH.N, N.Ya.

Geophysical methods for prospecting and studying the local uplifts of the central [illegible] depression. Neftegaz.geol. i geofiz. no.12:24-27 '64. (MIRA 18:3)

1. Turkmenskaya geofizicheskaya ekspeditsiya.

KUNIN, N.Ya.

Structural characteristics and prospects for finding oil and gas in the Mesozoic sediments of southern Kazakhstan. Geotektonika no.3:37-48 My-Je '65. (MIRA 18:6)

1. Turlanskaya geofizicheskaya ekspeditsiya, Chimkent.

KUNIN, N.Ya.; SAPOZHNIKOV, R.B.

Structure of the southeastern margin of the Caspian Lowland.
Geotektonika no.6:91-94 N-D '65. (MIRA 19:1)

1. Turlanskaya geofizicheskaya ekspeditsiya, Chimkent. Submitted May 26, 1965.

L 13860-66 EWT(1) GW
ACC NR: AT6004104 SOURCE CODE: UR/3152/65/000/008/0109/0113

AUTHOR: Davydov, N. G.; Zil'bershteyn, S. I.; Kunin, N. Ya.

ORG: none

TITLE: Use of the MBNP microbarometric level indicator in precision surveying

SOURCE: Razvedochnaya geofizika, no. 8, 1965, 109-113

TOPIC TAGS: pressure measuring instrument, surveying instrument, altimeter

ABSTRACT: The author gives data from tests of the MBNP microbarometric level indicator developed by the Moscow Gidrometpribor Factory in cooperation with the All-Union Scientific Research Institute of Geophysics. Tests at the Institute and at the Ukhta Geophysics Bureau have shown that the MBNP instruments may be used for determining altitudes with an accuracy of ±(0.7-0.8 m). A comparison of various instruments in the MBNP series showed an average deviation in readings of 0.015 mm Hg with deviations of 0.03-0.04 mm Hg in individual cases. Experience has shown that the following requirements are necessary for accuracy in using these instruments:
1. Station readings should be taken every 10-15 minutes. Use of a self-recording

Card 1/2

L 13860-66
ACC NR: AT6004104

microbarograph is recommended for optimum accuracy. 2. Distance from the station should be kept to a maximum of 10 km and for more accurate work to less than 5 km. 3. The instruments have a low zero drift and may be used for protracted observation on long runs. 4. Repeated control readings are necessary for checking accuracy at fixed points which make up a volume of no less than 20% of the number of coordinate points. The instruments are small, shock resistant and accurate and are recommended for use in gravimetry and precision surveying. Orig. art. has: 3 figures, 1 table.

SUB CODE: 08/ SUBM DATE: 00/ ORIG REF: 000/ OTH REF: 000

Card 2/2 BK

L 42121-66

ACC NR: AT6028379 SOURCE CODE: UR/0000/65/000/000/0142/0154 15

AUTHOR: Bachin, A. P.; Bekzhanov, G. R.; Brodovoy, V. V.; Gol'dshmidt, V. I.; Zhivoderov, A. B.; Zlavdinov, L. Z.; Ivanov, O. D.; Klenchin, I. N.; Kolmogorov, Yu. A.; Kotlyarov, V. M.; Kuz'min, Yu. I.; Kuminova, M. V.; Kunin, N. Ya.; Lyubetskiy, V. G.; Melent'yev, M. I.; Morozov, M. D.; Tret'yakov, V. G.; Tychkova, T. V.; Tsaregradskiy, V. A.; Eydlin, E. A.

ORG: none

TITLE: Geophysical sketch map of Kazakhstan

SOURCE: International Geological Congress. 22d, New Delhi, 1964, Geologicheskiye rezul'taty prikladnoy geofiziki (Geological results of applied geophysics); doklady sovetskikh geologov, problema 2. Moscow, Izd-vo Nedra, 1965, 142-154

TOPIC TAGS: ~~Kazakhstan~~ geophysics, map, ~~geophysical mapping~~, tectonics, ~~geosuture~~ regional study

ABSTRACT: On the basis of regional geophysical and geological investigations (seismic, gravimetric, magnetoelectric), a composite geophysical sketch map of the physical fields of Kazakhstan has been compiled. From this map, the major tectonic zones, deep structures, and geological structural zones are defined. Long zones representing high field gradients in the gravitational and magnetic fields reflect deep geosutures, which seismic sounding data suggest are scarps in the M-discontinuity

Card 1/2

L 42131-6

ACC NR: AT6028379

Among the major structural zones of Kazakhstan defined are: 1) the Turgayskaya, 2) the Petropavlovskaya, 3) the Uspenskaya, 4) the Tokrauskaya, and 5) the Dzhalair-Naymanskaya. Regions of magmatism are also defined. In the tectonic depression zones, contour lines indicate the thickness of the sedimentary cover, overlying the folded basement, and possible oil-bearing formations. Orig. art. has: 1 figure.[DM]

SUB CODE: 08/ SUBM DATE: 06Jan65/ ATD PRESS: 5063

Card 2/2

ACC NR: AP6030452 SOURCE CODE: UR/0031/66/000/008/0057/0060

AUTHOR: Kunin, N. Ya.

ORG: none

TITLE: Basic structural elements of closed regions of southern Kazakhstan along the Karatau Range

SOURCE: AN KazSSR. Vestnik, no. 8, 1966, 57-60

TOPIC TAGS: geologic exploration, physical geology, seismic prospecting, sediment, basement, metamorphism, ~~geological structure~~ stratigraphy, tectonics/Kazakhstan

ABSTRACT: The results are described of the deep-borehole geophysical exploration of the closed regions of southern Kazakhstan adjacent to the Karatau Range. The geophysical data are differentiated by the components of the basement, the intermediate structural layer, and the sedimentary cover of these regions. The heterogeneous basement of the region is dissected by deep-seated faults and block faults into large blocks and linear fold-block systems. Geosynclinal developments of the Karatau and Nuratau regions are related to the Hercynain cycle. The accumulation in southern Kazakhstan of sediments forming the intermediate structural layer took place during the Middle and Upper Paleozoic and the Lower Mesozoic. The degree of dislocation and metamorphism of this layer decreases upward and with the distance from the Hercynian layer. The lower boundary of the intermediate structural layer is tentatively taken as the Middle and Upper Devonian

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ACC NR: AP6030452

while the upper boundary is in the Middle Jurassic. An analysis is made of four large regions of accumulation of major series of the intermediate structural layer. The Kokpansor-Tesbulak layer has a Dzherkazgan-type cross section. The Syzak-Muyunkum region has a relatively minor sedimentary layer in the Lower Carboniferous and large Permian salt beds with thickness increasing east to 300 m and more. The Arys region is characterized by considerable upper Devonian-Carboniferous sediments related to the transgression of the Central-Asiatic basin. The Dekantash region has primarily terrigenous and terrigenoeffusive formations. The structural regionalization of the Mesozoic-Cenozoic sedimentary layer and the study of central Syr-Darya depressions in which the most stable sedimentation took place make it possible to consider them as probable oil and gas bearing layers. Orig. art. has: 1 figure.

SUB CODE: 08/ SUBM DATE: none/

Card 2/2

ACC NR: AR6024837 SOURCE CODE: UR/0169/66/000/004/G003/G004

AUTHOR: Bekzhanov, G. R.; Brodovoy, V. V.; Gol'dshmidt, V. I.; Zhivoderov, A. B.; Zlavdinov, L. Z.; Ivanov, O. D.; Kichin, I. N.; Kolmogorov, Yu. A.; Bachin, A. P.; Kotyarov, V. M.; Kuz'min, Yu. I.; Kuminova, M. V.; Kunin, N. Ya.; Lyubetskiy, V. G.; Melent'yev, M. I.; Morozov, M. D.; Tret'yakov, V. G.; Tychkova, T. V.; Tsaregradskiy, V. A.; Eydlin, R. A.

TITLE: A schematic geophysical map of Kazakhstan

SOURCE: Ref. zh. Geofizika, Abs. 4G17

REF SOURCE: Sb. Geol. rezul'taty prikl. geofiz. Geofiz. issled. stroyeniya zemn. kory. M., Nedra, 1965, 142-154

TOPIC TAGS: geologic survey, geologic prospecting, map

ABSTRACT: Regional geophysical surveys are conducted in Kazakhstan to divide the territory into tectonic regions, to study its plutonic structure, and to solve some problems of geophysical mapping. The results of these surveys will make it possible to establish structural belts and regions in which minerals are likely to be found. The basic material will be obtained from investigations of the magnetic and gravitational fields in combination with seismic studies. In the magnetic and gravitational fields, tectonic and plutonic seams are isolated which correspond to terraces in the

Card 1/2 UDC: 550.311(574)

ACC NR: AR6024837

Mohorovicic discontinuity. Methods of regional geophysics are used to study the plutonic structure of a folded base, the structure and thickness of sedimentary sheaths, and to indicate prospective petroleum bearing uplifts. [Translation of abstract]
M. Speranskiy

SUB CODE: 08

Card 2/2

BR

ACCESSION NR: AP3007869 S/0197/63/000/008/0057/0062

AUTHORS: Kunin, P.; Taksar, I.; Shiltere, M.; Shilter, E.

TITLE: On energy spectra and oscillator forces in single valence atoms

SOURCE: AN LatSSR. Izvestiya, no. 8, 1963, 57-62

TOPIC TAGS: Shrödinger equation, single valence atom, potential field, neutral atom, single charge ion, lithium atom, sodium atom, potassium atom

ABSTRACT: The Shrödinger equation has been solved for single-valence atoms in two effective potential fields given by

$$U=-\frac{B}{r}+\frac{s(s+1)}{2r^2}, \quad (1)$$

where B = 1 for neutral atoms, B = 2 for single-charge ions, etc., and by a second, more complicated, one given by

$$U=\frac{-2r^2-2ar+s(s+1)b}{2r^2(r+b)} \quad (2)$$

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ACCESSION NR: AP3007869

A closed form solution is obtained for (1) and a three-term recurrence formula, represented by a series, for (2). Detailed numerical computations on an electronic computer are obtained for lithium, sodium, and potassium atoms and in isoelectron series of lithium. The various parameters appearing in the equations for various energy levels are determined from experimental data. All computations were performed on the BESM-2 VTs computer at Latviyskiy gosudarstvennogo universitet Im. P. Stuchki (Latvian State University). Orig. art. has: 12 formulas and 1 table.

ASSOCIATION: none

SUBMITTED: 26Dec62 DATE ACQ: 21Oct63 ENCL: 00

SUB CODE: PH NO REF SOV: 003 OTHER: 000

Card 2/2

KUNIN, P.; TAKSAR, I.; SHILTER, E. [Silters, E.]

Effective potential method for determining the sodium atom. Izv. AN Latv. SSR no.10:49-53 '63. (MIRA 17:1)

ZAPOL', B.; KUNIN, P.; TAKSAR, I.; TSIRULE, Z. [Cirule, Z.]

Effective potential method for calculating the energy spectrum and wave functions of univalent atoms. Izv. AN Latv. SSR no.10:54-56 '63. (MIRA 17:1)

DAL'SKIY, A.M., kand. tekhn. nauk, red.; KUNIN, P.A., inzh., red.

[Metalworking by cutting and pressure] Obrabotka metallov rezaniem i davleniem. Moskva, Mashinostroenie, 1965. 138 p. (MIRA 18:9)

KASHEPAVA, Moisey Yakovlevich; ACHERKAN, N.S., prof., doktor tekhn. nauk, retsenzent; KUNIN, P.A., inzh., red.; CHERNOVA, Z.I., tekhn. red.

[Modern jig boring machines] Sovremennye koordinatno-rastochnye stanki. Moskva, Mashgiz, 1961. 279 p. (MIRA 14:10)
(Drilling and boring machinery)

FRUMIN, Yu.L.; LUKASHEVICH, G.Ye., inzh., retsenzent; KUNIN, P.A., inzh., red.; UVAROVA, A.F., tekhn.red.

[High-production thread-generating tools] Vysokoproizvoditel'nyi rez'boobrazuiushchii instrument. Moskva, Mashgiz, 1963. 162 p. (MIRA 16:6)

(Screw cutting) (Screw-thread rolling)

PER, Abram Grigor'yevich; KHRUL'KOV, V.A., kand. tekhn.nauk, retsenzent; KUNIN, P.A., inzh., red.; STEPANOVA, A.A., red. izd-va; NOVIK, A.Ya., tekhn. red.

[Diamond and fine machining in the manufacture of instruments] Almaznaia i tonkaia obrabotka v priborostroenii. Moskva, Oborongiz, 1963. 186 p. (MIRA 16:4)
(Metal cutting) (Instrument manufacture)

RAUZIN, Ya.R., doktor tekhn. nauk; Prinimal uchastiye SPEKTOR, A.G., kand. tekhn.nauk; SHEYN, A.S., kand. tekhn.nauk, retsenzent; KUNIN, P.A., inzh., red.; MODEL', B.I., tekhn. red.

[Heat treatment of chromium steel; for bearings and tools] Termicheskaia obrabotka khromistoi stali; dlia podshipnikov i instrumentov. Izd.2., perer. i dop. Moskva, Mashgiz, 1963. 383 p. (MIRA 16:8)

(Chromium steel--Heat treatment)

DANILEVSKIY, Vladimir Viktorovich; GAVRILOV, A.N., prof., doktor tekhn. nauk, retsenzent; KHOLIN, V.A., inzh., retsenzent; KUNIN, P.A., red.; VARGANOVA, A.N., red.izd-va; MURASHOVA, V.A., tekhn. red.

[Technology of the manufacture of machinery; general course] Tekhnologiia mashinostroeniia; obshchii kurs. Moskva, Vysshaia shkola, 1963. 505 p. (MIRA 17:2)

ZAMALIN, Yu.S.; DYMSHITS, Ye.S., inzh., retsenzent; KUNIN, P.A., inzh., red.

[Drilling holes in parts of machinery housings] Rastachivanie korpusnykh detalei. Moskva, Izd-vo "Mashinostroenie," 1964. 109 p. (MIRA 17:6)

BALYURA, P.G.; KATSEV, P.G., kand. tekhn. nauk, retsenzent;
KUNIN, P.A., inzh., red.

[Broaching of grooves] Protiagivanie pazov. Moskva, Mashinostroenie, 1964. 170 p. (MIRA 18:3)

KHRISTICH, Z.D., dots., kand. tekhn. nauk; KAUGLYAK, L.A., inzh., retsenzent; KUNIN, I.A., inzh., red.

[Automation of the manufacture of metal-cutting tools] Avtomatizatsiia instrumental'nogo proizvodstva. Moskva, Mashinostroenie, 1964. 215 p. (MIRA 17:10)

CHERNAVSKIY, G.N., kand. tekhn. nauk, dots. [deceased];YARKOV, A.M., inzh., retsenzent; KUNIN, P.A., inzh., red.

[Fundamentals of an efficient use of automatic and semi-automatic lathes; machining ring and bushing type parts] Osnovy ratsional'nogo ispol'zovaniia tokarnykh avtomatov i poluavtomatov; obrabotka detalei tipa kolets i vtulok. Moskva, Izd-vo "Mashinostroenie," 1964. 214 p.
(MIRA 17:7)

SEMKO, M.F., prof.; BASKAKOV, I.G., kand. tekhn. nauk; DROZHZHIN, V.I., inzh.; KACHER, V.A., kand. tekhn. nauk; RUDNEV, A.V., kand. tekhn. nauk, retsenzent; KUNIN, P.A., inzh., red.

[Machining plastics; milling] Mekhanicheskaia obrabotka plastmass; frezerovanie. Moskva, Mashinostroenie, 1965. 131 p. (MIRA 18:3)

BROMBERG, B.M.; DASHEVSKIY, T.B.; LANDON, E.A.; LOMAKIN, V.K.; MIKHEYEV, Yu.Ye., inzh., retsenzent; KUNIN, P.A., inzh., red.

[Diamond boring machines; their design and adjustment] Almazno-rastochnye stanki; konstruktsii i naladki. Moskva, Mashinostroenie, 1965. 243 p. (MIRA 18:8)

YEGOROV, Mikhail Yegorovich, doktor tekhn. nauk, prof.; DEMENT'YEV, Vladimir Ivanovich, kand. tekhn.nauk, dots.; TISHIN, Sergey Dmitriyevich, kand. tekhn. nauk, dots.[deceased]; DMITRIYEV Vitaliy L'vovich, kand. tekhn. nauk, dots.; VLADZIYEVSKIY, A.P., doktor tekhn. nauk, prof., retsenzent; KUNIN, P.A., inzh., red.

[Technology of machinery manufacture] Tekhnologiia mashinostroeniia. Moskva, Vysshaia shkola, 1965. 589 p.
(MIRA 18:8)

KUNIN, P.A.

International Unit System in the literature on machinery.
Standartizatsiia 29 no.10:47-49 O '65.
(MIRA 18:12)

1. KUNIN, P. YE.; TAKSAR, I. M.

2. USSR 600

4. Quantum Theory

7. Passage of a particle with $\frac{1}{2}$ spin theough a potential barrier in scalar interaction, Latv. PSR Zin Akad Vestis, No. 10, 1951.

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

1. KUNIN, P. YE.; TAKSAR, I. M.

2. USSR 600

4. Quantum Theory

7. Presence of stable states in a particle with $\frac{1}{2}$ spin in a central field with a pole of high order, Latv. PSR Zin Akad Vestis, No. 11, 1951.

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

1. KUNIN, P. YE.; TAKSAR, I. M.

2. USSR 600

4. Particles

7. Behavior of a particle in a central field with a pole of high order, Latv. PSR Zin. Akad. Vestis, No. 11, 1951.

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

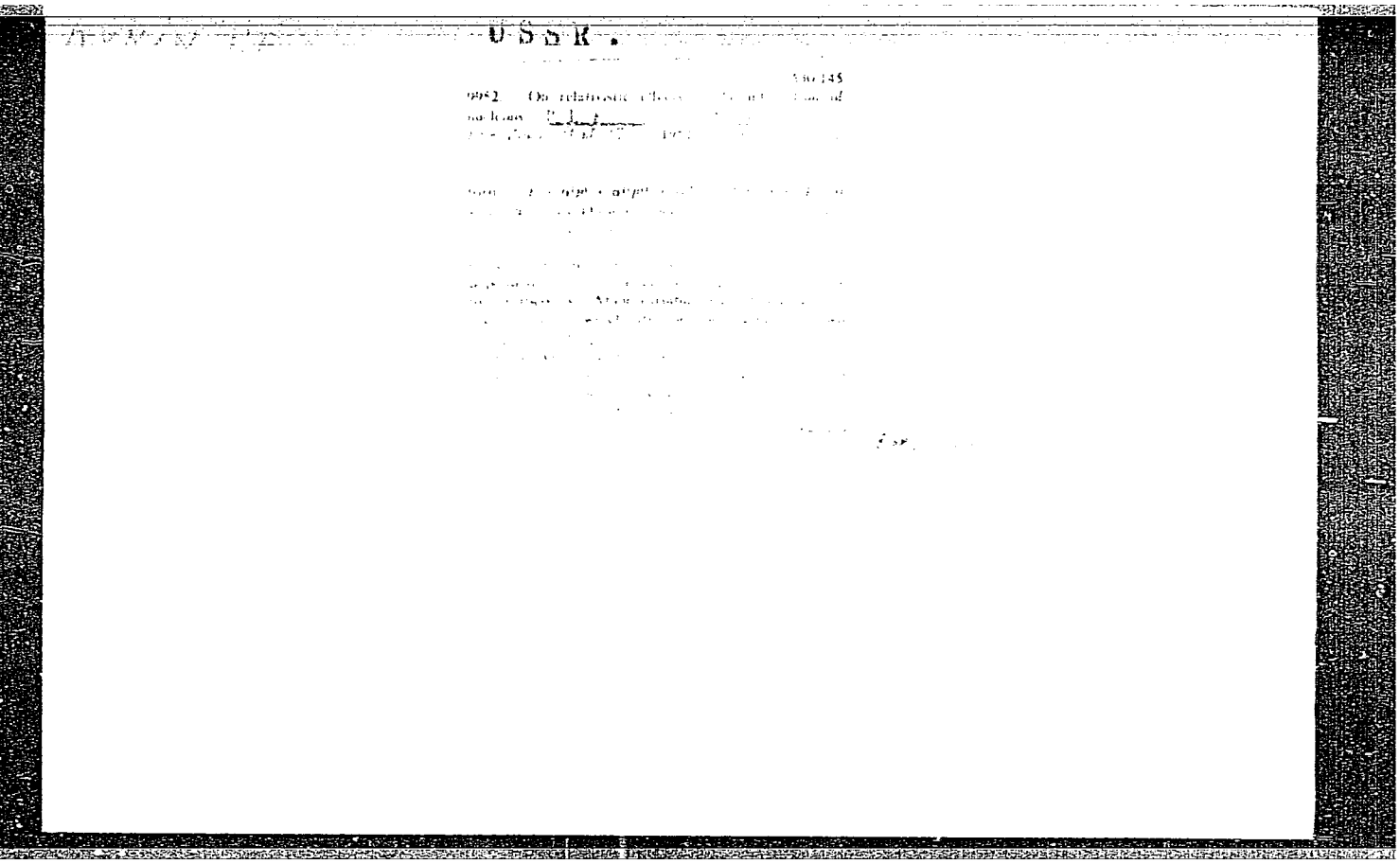
KUNIN, P.

Calculation of relativistic effects of proton-proton scattering. Latv. PSR Zin.Akad.Vēstis no.2:121-135 '52. (MLRA 6:6)
(Electric discharges) (Protons)

KUNIN, P.

Proton-proton scattering in P-states. Latv. PSR Zin.Akad.Vēstis no.4:101-106 '52. (MLRA 6:7)

1. Latviyskiy gosudarstvennyy universitet. (Protons) (Quantum theory)



KUNIN, P. YE.

USSR/Theoretical Physics - Quantum Field Theory B-6

Abst Journal : Referat Zhur - Fizika, No 12, 1956, 33799

Author : Kunin, P. Ye., Taksar, I. M.

Institution : None

Title : Nucleon Interaction with Allowance for Isobar States

Original Periodical : Latvijas PSR zinatnu akademijas Vestis, 1956, No 2, 105-115

Abstract : Nucleon interaction is considered with allowances for the isobar state of the nucleon, which is treated from the point of view of the semiphenomenological theory of I. E. Tamm and others (Referat Zhur - Fizika, 1955, 13184). The state of a system consisting of 2 nucleons is described by a wave function, which has many components, so that one or both nucleons can be in the isobar state. A system of integral equations of the covariant type is obtained

Card 1/2

Abst Journal : Referat Zhur - Fizika, No 12, 1958, 33799

for the components of the wave function. Next, one ignores in this system of equations those components which vanish in the absence of a field. Inasmuch as the interaction with the isobar can be considered small, these components yield correction for the next approximation of the perturbation theory. A transition is then effected from 4-dimensional functions to 3-dimensional ones for which a system of 36 integral equations of the Tamm-Dancoff type with 36 unknown functions is formulated. This system can be applied to processes in which the nucleons are both in free as well as in bound states.

AUTHOR KUNIN, P.E., TAKAR, I.M., PA - 2962

TITLE Some Relativistic Peculiarities of the Behavior of the Particles with Spin 1/2.
(Nekotoryye relyativistikiye osobennosti povedeniya chastits so spinom 1/2 - Russian)

PERIODICAL Zhurnal Eksperim.i Teoret. Fiziki, 1957, Vol 32, Nr 3, pp 506-509, (U.S.S.R.)
Received 6/1957 Reviewed 7/1957

ABSTRACT In the case of scalar interaction the potential of the interaction between the particle and the field is invariant, whilst in the case of electrostatic (vectorial) interaction the potential consists of the fourth component of a fourdimensional vector. Therefore the DIRAC equations which describe the behavior of a particle with spin 1/2 in the scalar field, have the following form, $\left\{E-i\left(\alpha_1\frac{\partial}{\partial x}+\alpha_2\frac{\partial}{\partial y}+\alpha_3\frac{\partial}{\partial z}\right)+\beta_3(E_0+U)\right\}\psi=0$

Here E denotes the total energy of the particle, E_0 - its rest energy, U - the potential energy of the particle in the scalar field, $\alpha_1,\alpha_2,\alpha_3$, and β_3 - DIRAC matrices. PLANCK'S constant and the velocity of light are here put equal to 1. The authors here examine the onedimensional motion of the particle in the direction of the Ox-axis in a field, which represents a straight potential barrier of the form $U=0(x<0)$, $U=U_0(x>0)$ Here also the solution of the SCHRODINGER equation is set up in the form of the plane waves $\psi_i = a_i e^{ipx} + b_i e^{-ipx}(x<0)$, $_i = c_i e^{ipx}(x>0)$, and by

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Some Relativistic Pecularities of the Behavior of the Particles with Spin 1/2. PA - 2962

means of this ansatz the following relations are obtained, $p_2^2 = E^2 - -(E_0 + U_0)^2$. With $E = E_0+U_0$ the reflection coefficient is equal to 1. There is no passage of particles through a sufficiently high barrier (and no KLEIN's paradox) in the case of scalar interaction. But also in the case of pseudoscalar interaction there is a paradoxical phenomenon, the particle is also not able to penetrate into a sufficiently deep "well". These results do not only apply to an even, but also to a "smoothed" barrier. In the case $U(x) = V/(1+e^{-ax})$, V = const the exact solution for DIRAC's equations can be found by means of hypergeometric functions. Also for the reflection coefficient an explicit expression is given. In a scalar centrally symmetric field with the potential energy $U = a/r^n$ the particle does not tend in the direction of the attracting center. This phenomen is not a quantum effect but it occurs also in the classical relativistic theory. (No ill.).

ASSOCIATION Latvian State University, Physical Institute of the Academy of Science of the Latvian SSR.

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SUBMITTED 7.1.1956.
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L 01168-66 EWT(1) IJP(c)

ACCESSION NR: AP5016658

UR/0382/65/000/002/0101/0110
538.4+621.689

AUTHOR: Valdmanis, Ya. Ya.; Kunin, P. Ye.; Mikel'son, Yu. Ya.; Taksar, I. M.

TITLE: Conducting slab in a traveling electromagnetic field of a two-sided inductor

SOURCE: Magnitnaya gidrodinamika, no. 2, 1965, 101-110

TOPIC TAGS: MHD, electromagnetic field, current density, magnetic induction

ABSTRACT: Theoretical study of current density and magnetic induction in a slab with conductivity σ and permeability μ_0 is reported. The slab is placed between linear round conductors; the slab and conductors are between regions characterized by infinite permeability. These are denoted as regions I, II, III in fig. 1 of the Enclosure. The conductors producing the traveling magnetic field are connected to a three-phase generator. The solution for magnetic vector potential and current density are obtained by writing out both as infinite series and appropriate boundary conditions are applied. The resulting magnetic induction (and current density) then

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ACCESSION NR: AP5016658

lead to the expression for the magnetic force density components along and across the conducting slab. The conditions for minimizing the effects of various harmonics on the magnetic force density are given as well as its dependance on the skin depth in the slab and separation of conductors from the slab. Change in force density is also considered when N conductors are connected to a given phase. The differences between the two cases are pointed out and it is noted that only a small increase in force density can be achieved. Finally, two more cases are considered where the current-carrying round conductors are replaced by flat plates with and without separation between them. The average force density is computed to within 0.1%. Orig. art. has: 46 formulas, 4 figures.

ASSOCIATION: none

SUBMITTED: 01Oct64 ENCL: 01 SUB CODE: EM, ME

NO REF SOV: 002 OTHER: 000

Card 2/3

L 01168-66

ACCESSION NR: AP5016658 ENCLOSURE: 01

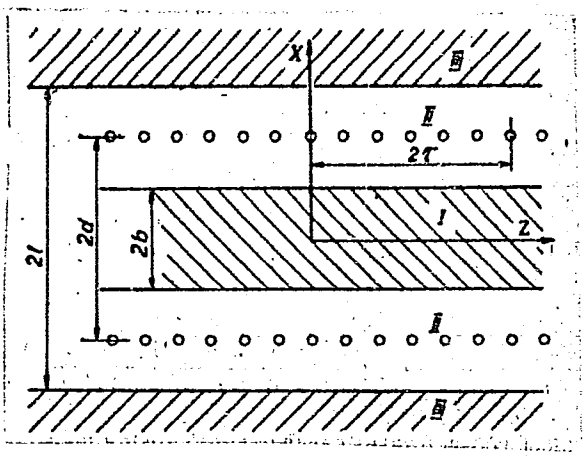


Fig. 1.
I--Infinite conducting slab with conductivity σ and permeability μ_0
II--Region with conductivity $\sigma = 0$ and $\mu = \mu_0$
III--Region with $\mu = \infty$ and $\sigma = 0$

Card 3/3

KUNIN, R.Z.

Study of electrical loads. Trudy LIEI no.51:109-121 '64. (MIRA 18:11)

KUNIN, Samuil Karpovich; ZOTOV, V.A., redaktor; PETROVA, M.D., tekhnicheskiy redaktor

[Problems of pre-school hygiene] Voprosy doshkolnoi gigieny. Moskva, Gos. uchebno-pedagog.izd-vo Ministerstva prosveshcheniia RSFSR, 1954. 212 p. (MLRA 8:5)
(Children--Care and hygiene)

KUNIN, Samuil Karpovich; DANILOVA, M.P., red.; KREYS, I.G., tekhn.red.

[Preschool hygiene] Doshkol'naia gigiena. Izd.2. Moskva, Gos.uchebno-pedagog.izd-vo M-va prosv. RSFSR, 1958. 205 p. (MIRA 12:3)

(CHILDREN--CARE AND HYGIENE)

KUNIN, S.K., dotsent

Urgent problems in the hygiene of preschool education. Gig. i san. 24 no.7:31-37 Jl '59. (MIRA 12:9)

1. Iz kafedry fizicheskogo vospitaniya i shkol'noy gigiyeny Leningradskogo pedagogicheskogo instituta imeni A.I.Gertsena.
(SCHOOL HEALTH
hyg. problems of preschool educ. facilities (Rus))

KUNIN, S.K., dotsent; KRIVITSKAYA, E.I., dotsent

Physiological and hygienic evaluation of various forms of artificial illumination in classrooms. Gig. i san. 26 no.4:32-36 Ap '61. (MIRA 15:5)

1. Iz kafedry teorii i metodiki fizicheskogo vospitaniya i shkol'noy gigiyeny Leningradskogo pedagogicheskogo instituta imeni A.I.Gertsena.
(SCHOOLHOUSES—LIGHTING)

COUNTRY: USSR
CATEGORY: Forestry. Forest Management.

ABS. JOUR.: Ref Zhur-Biologiya, No. 1, 1959, No. 147[illegible]

AUTHOR: Lunin, [illegible]
INST.: Ukrainian Agric. Acad.
TITLE: Nature and Management of Forest Economy in Kaliningrad Forests.

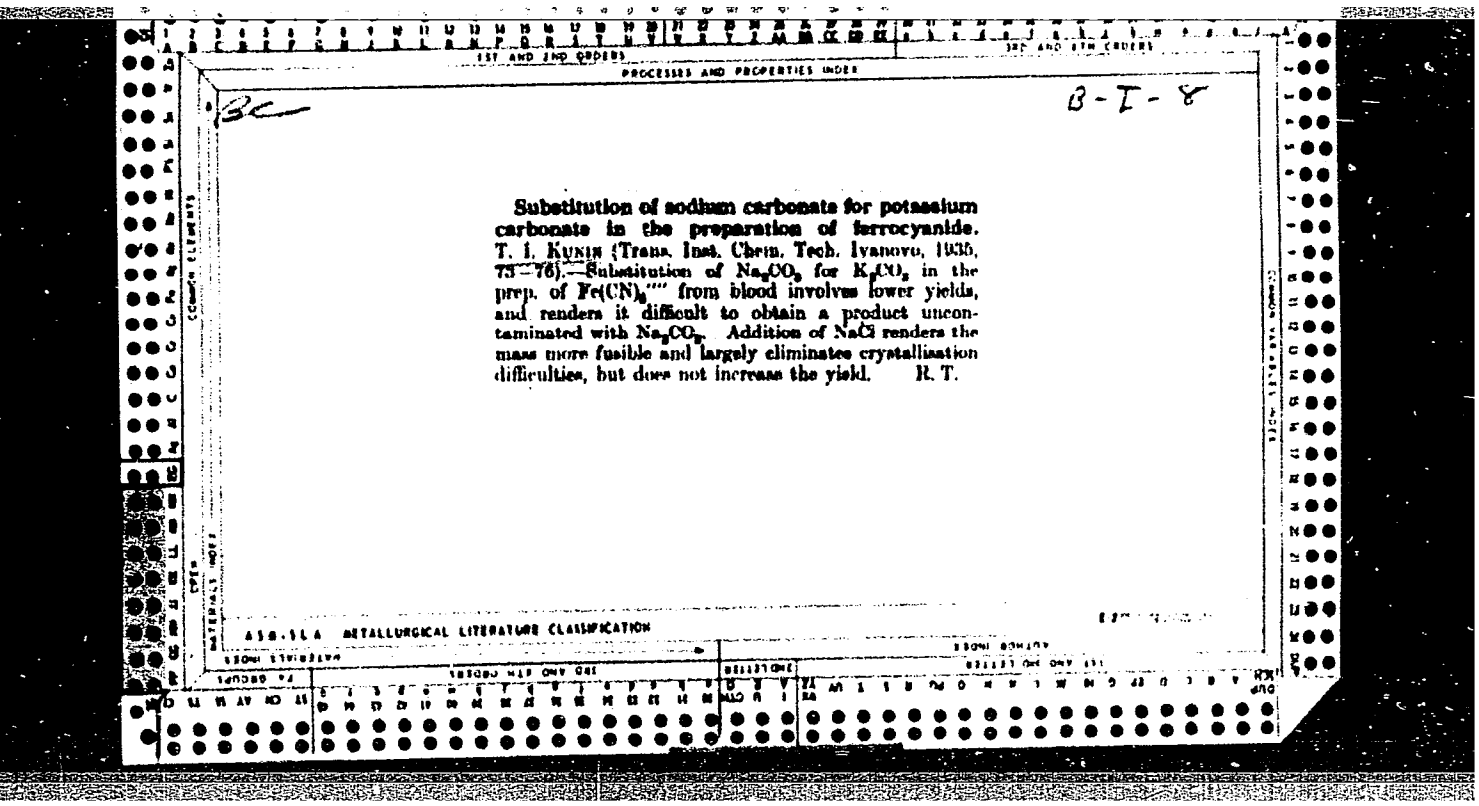
ORIG. PUB.: Sb. stud. nauchno-issl. [illegible] Ukr. s.-kh. akad., 195[illegible], vyp. 3, 153-156

ABSTRACT: No abstract

1/1

MITROFANOV, V.P.; KUNOV, S.S., red.; POT'KALOVA, G.M., tekhn. red.

[Life-giving waters of the Kuban; construction of the Kuban-Kalaus Irrigation and Water Supply System] Zhivitel'nye vody Kubani; o stroitel'stve Kuban'-Kalausskoi obvodnitel'no-orositel'noi sistemy. Cherkessk, Karachaevo-Cherkesskoe knizhnoe izd-vo, 1962. 39 p. (MIRA 16:4)
(Kuban—Water supply)



PROCESSES AND PROPERTIES INDEX

B-I-8

Substitution of sodium carbonate for potassium carbonate in the preparation of ferrocyanide. T. I. KUNIN (Trans. Inst. Chem. Tech. Ivanovo, 1935, 73—76).—Substitution of Na_2CO_3 for K_2CO_3 in the prep. of $Fe(CN)_6^{''''}$ from blood involves lower yields, and renders it difficult to obtain a product uncontaminated with Na_2CO_3. Addition of NaCl renders the mass more fusible and largely eliminates crystallisation difficulties, but does not increase the yield. R. T.

A58-11A METALLURGICAL LITERATURE CLASSIFICATION

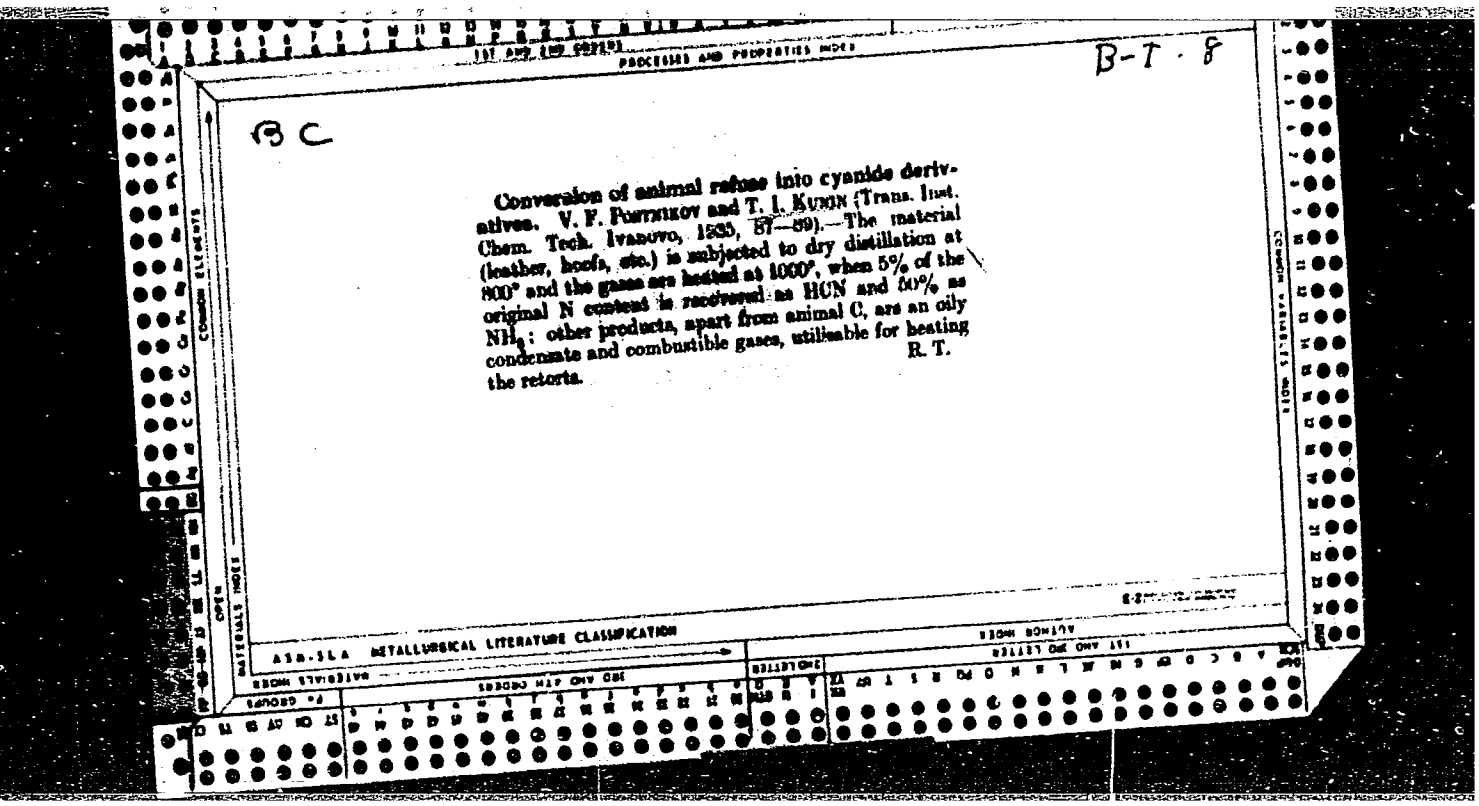
BC

B-I-8

PROCESSES AND PROPERTIES INDEX

Preparation of sodium ferrocyanide from calcium cyanamide. V. F. Postnikov, T. I. Kunin, and A. C. Vasilnikov (Trans. Inst. Chem. Tech. Ivanovo, 1935, 77—86).—39% of the N of $CaCN_2$ is recovered as NaCN by heating a mixture of $CaCN_2$ 43·1, Na_2CO_3 24·1, NaCl 24·1, and C 8·6% at 880° for 10 min., and cooling the melt in H_2O. The NaCN is converted into $Na_4Fe(CN)_6$ by adding a small excess of $FeSO_4$ to the aq. solution, and no difficulties arise owing to the simultaneous crystallisation of $Na_2CO_3,10H_2O$. Crude Na_2CO_3 is applicable to the process. R. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

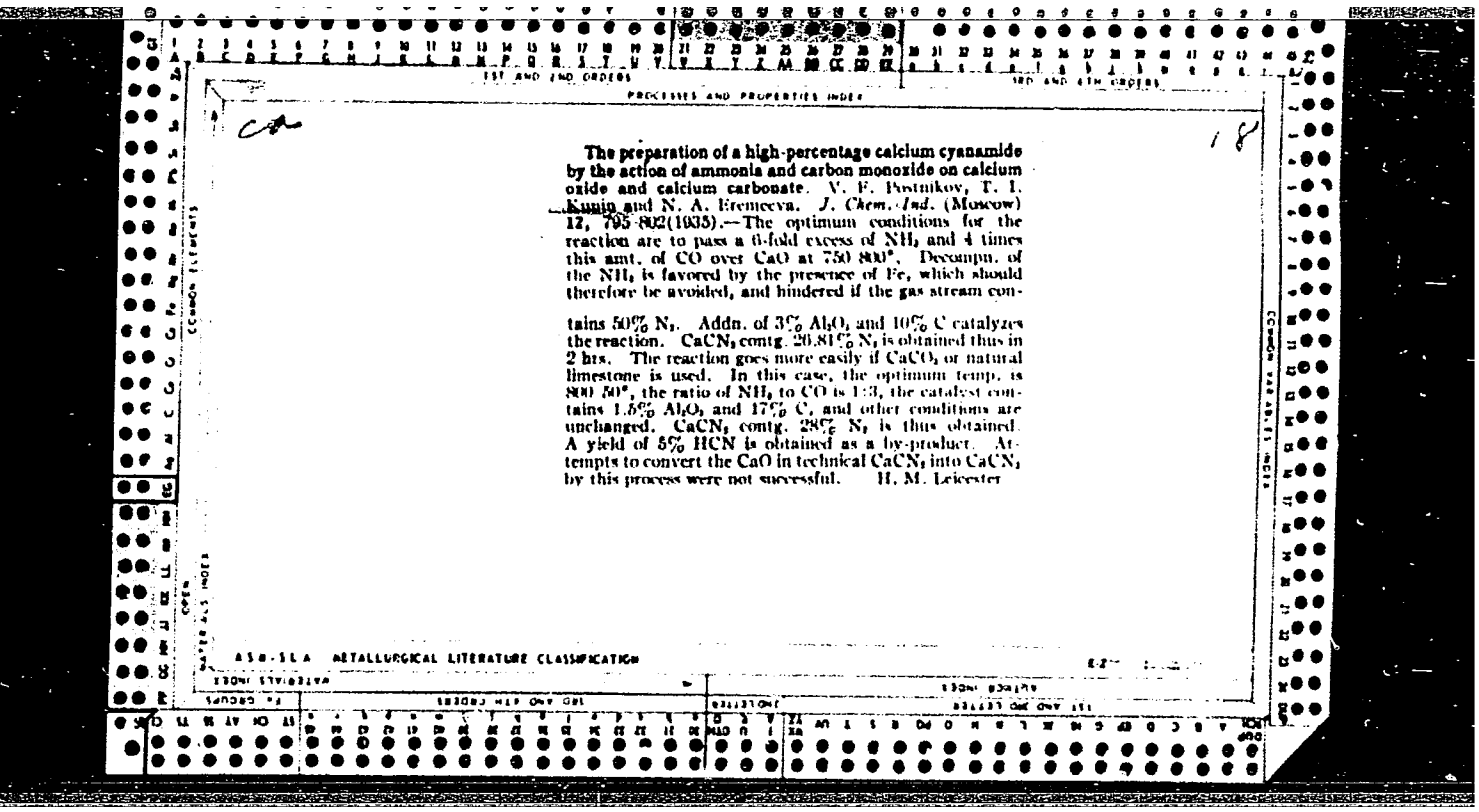


B-T-8

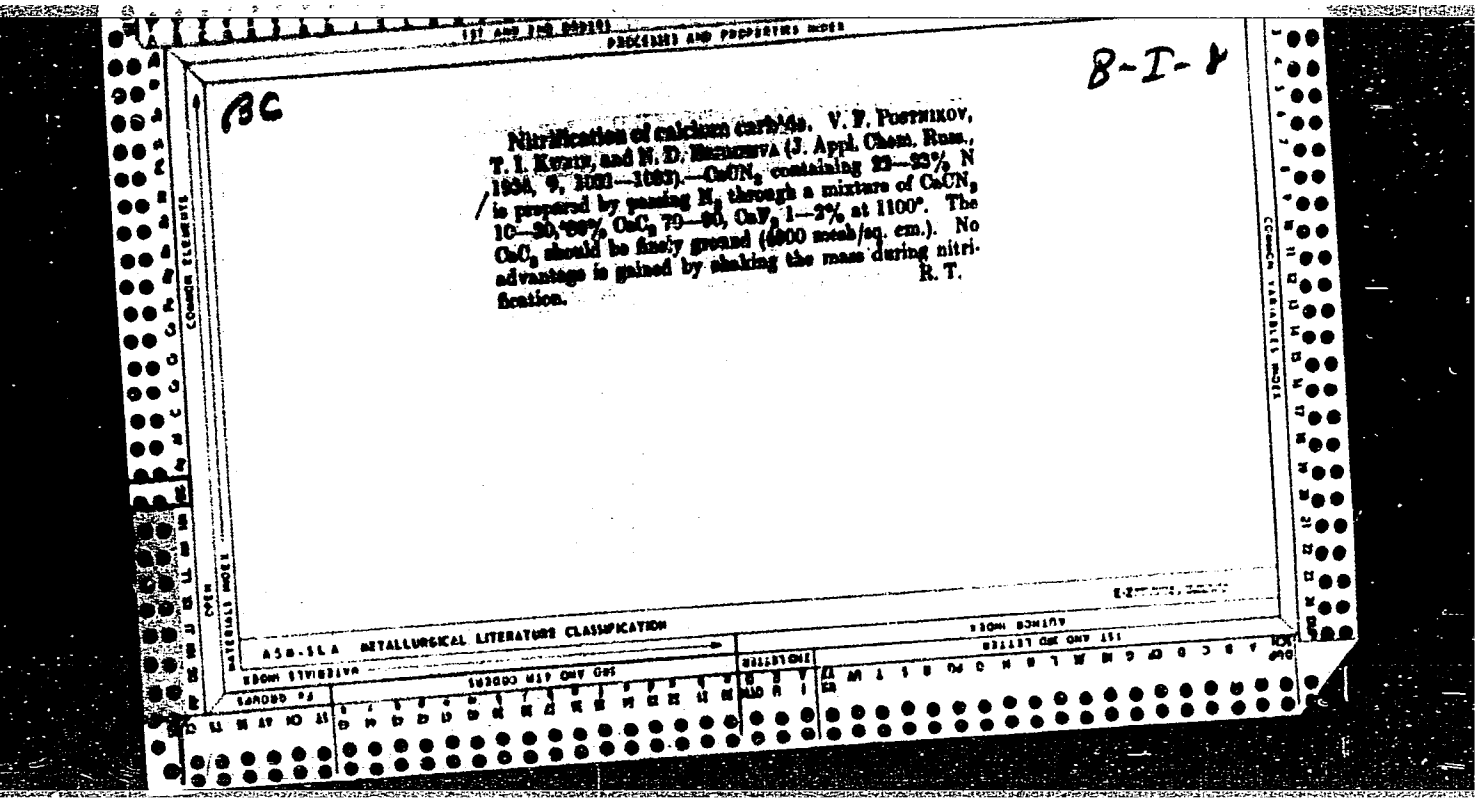
BC

Conversion of animal refuse into cyanide derivatives. V. F. PUSTNIKOV and T. I. KUNIN (Trans. Inst. Chem. Tech. Ivanovo, 1955, 87—89).—The material (leather, hoofs, etc.) is subjected to dry distillation at 800° and the gases are heated at 1000°, when 5% of the original N content is recovered as HCN and 60% as NH_3; other products, apart from animal C, are an oily condensate and combustible gases, utilisable for heating the retorts.

R. T.



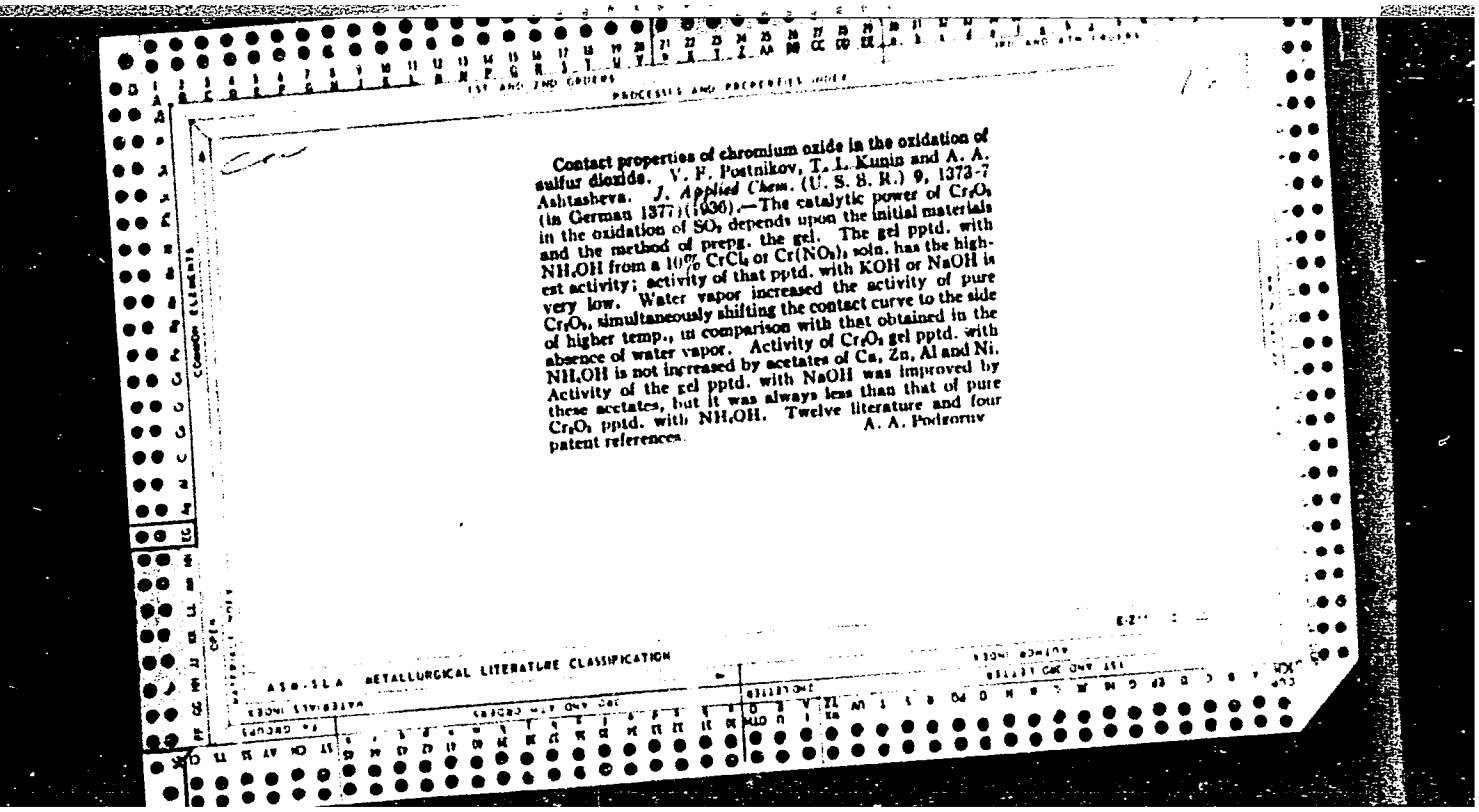
The preparation of a high-percentage calcium cyanamide by the action of ammonia and carbon monoxide on calcium oxide and calcium carbonate. V. F. Postnikov, T. I. Kunin and N. A. Efremeeva. *J. Chem. Ind.* (Moscow) 12, 795-802(1935).—The optimum conditions for the reaction are to pass a 6-fold excess of NH_3 and 4 times this amt. of CO over CaO at 750-800°. Decompn. of the NH_3 is favored by the presence of Fe, which should therefore be avoided, and hindered if the gas stream contains 50% N_2. Addn. of 3% Al_2O_3 and 10% C catalyzes the reaction. $CaCN_2$ contg. 20.81% N is obtained thus in 2 hrs. The reaction goes more easily if $CaCO_3$ or natural limestone is used. In this case, the optimum temp. is 800-50°, the ratio of NH_3 to CO is 1:3, the catalyst contains 1.5% Al_2O_3 and 17% C, and other conditions are unchanged. $CaCN_2$ contg. 28% N_2 is thus obtained. A yield of 5% HCN is obtained as a by-product. Attempts to convert the CaO in technical $CaCN_2$ into $CaCN_2$ by this process were not successful. H. M. Leicester



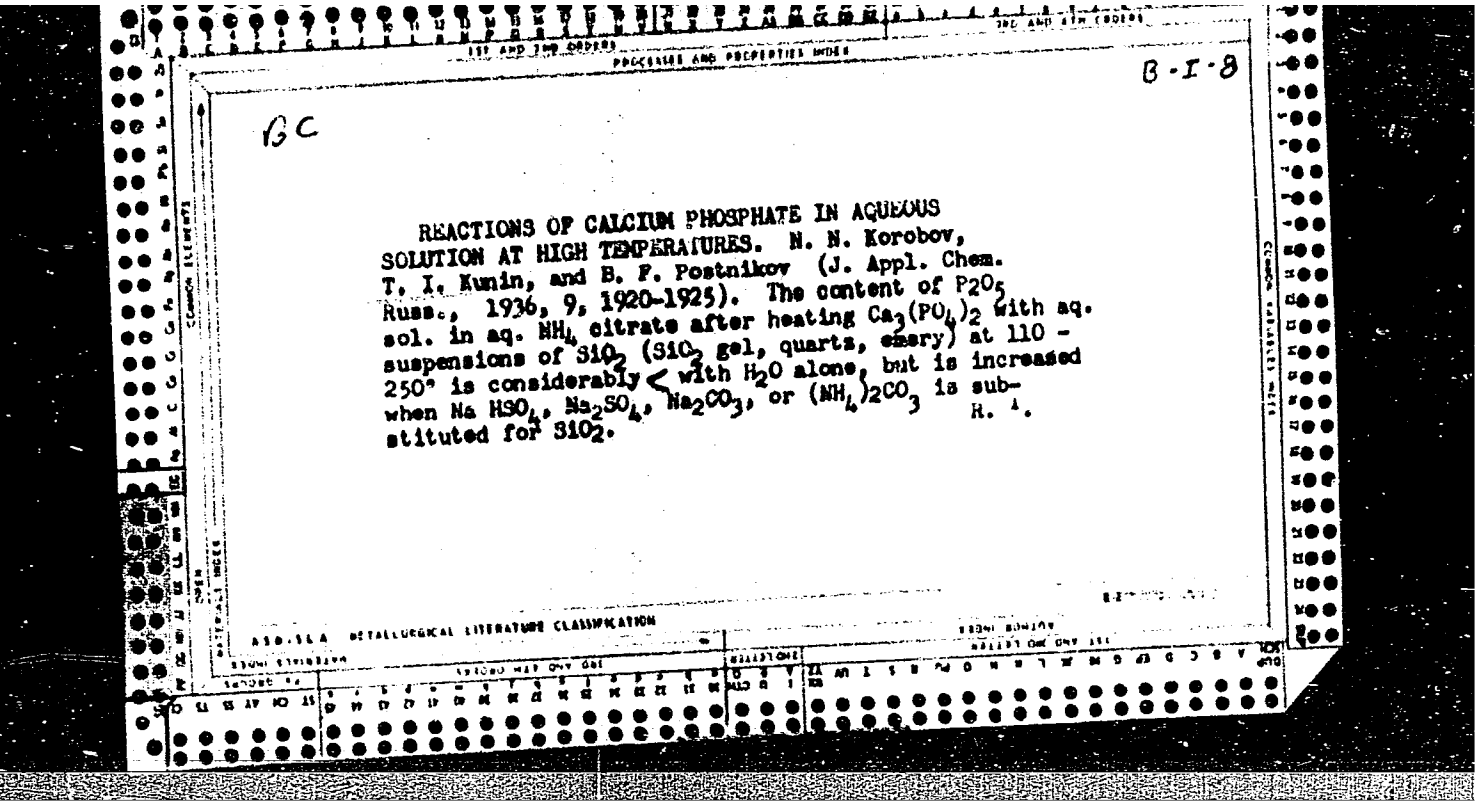
B-I-4

BC

Nitrification of calcium carbide. V. F. Postnikov, T. I. Kvasz, and N. D. Shmonova (J. Appl. Chem. Russ., 1934, 7, 1081—1083).—$CaCN_2$ containing 22—23% N is prepared by passing N_2 through a mixture of $CaCN_2$ 10—20, 98% CaC_2 79—80, CaF_2 1—2% at 1100°. The CaC_2 should be finely ground (4900 mesh/sq. cm.). No advantage is gained by shaking the mass during nitrification. R. T.



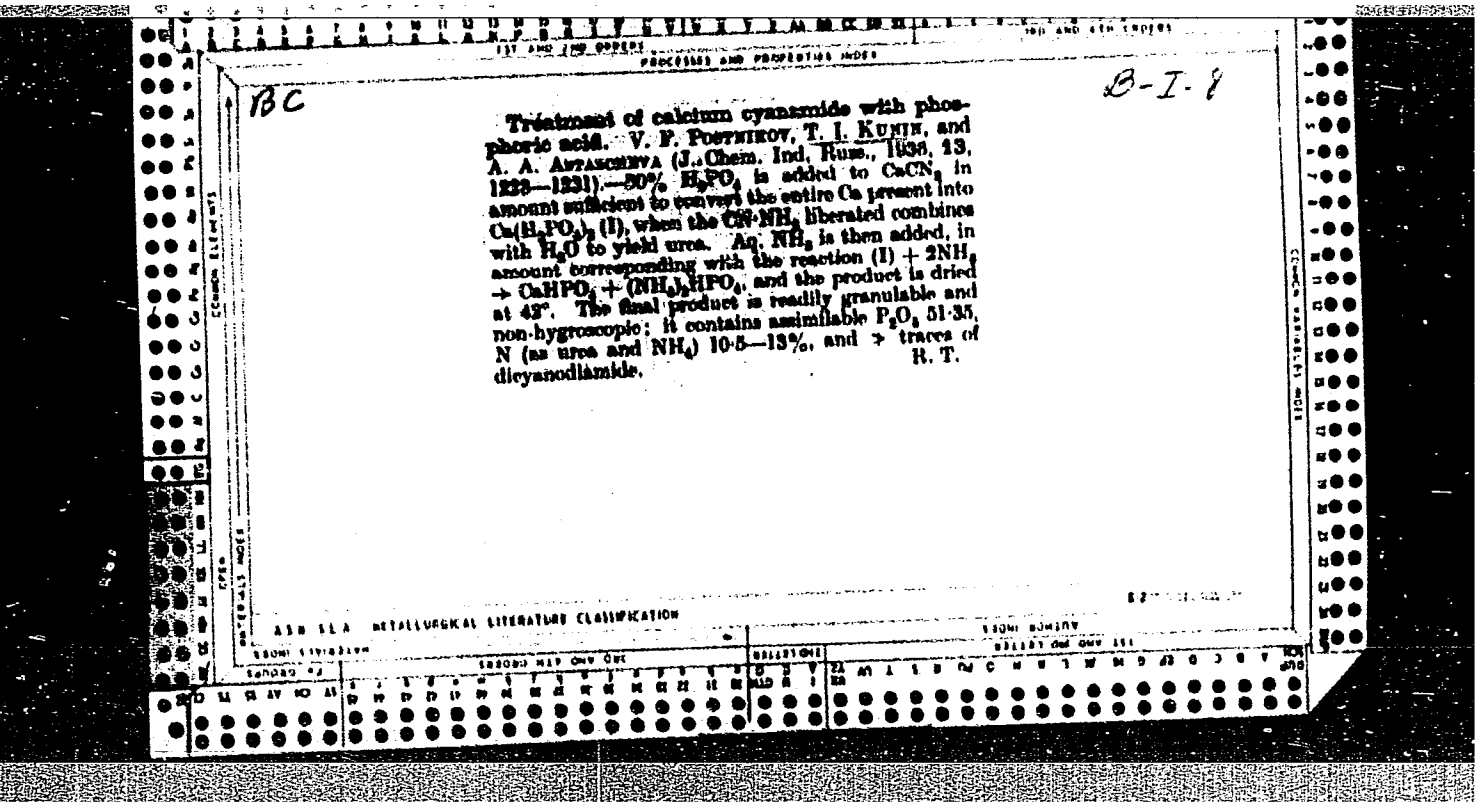
Contact properties of chromium oxide in the oxidation of sulfur dioxide. V. F. Postnikov, T. I. Kunin and A. A. Ashtasheva. *J. Applied Chem.* (U. S. S. R.) 9, 1373-7 (in German 1377) (1936).—The catalytic power of Cr_2O_3 in the oxidation of SO_2 depends upon the initial materials and the method of prepg. the gel. The gel pptd. with NH_4OH from a 10% $CrCl_3$ or $Cr(NO_3)_3$ soln. has the highest activity; activity of that pptd. with KOH or NaOH is very low. Water vapor increased the activity of pure Cr_2O_3, simultaneously shifting the contact curve to the side of higher temp., in comparison with that obtained in the absence of water vapor. Activity of Cr_2O_3 gel pptd. with NH_4OH is not increased by acetates of Ca, Zn, Al and Ni. Activity of the gel pptd. with NaOH was improved by these acetates, but it was always less than that of pure Cr_2O_3 pptd. with NH_4OH. Twelve literature and four patent references. A. A. Podgornv



B-I-8

BC

REACTIONS OF CALCIUM PHOSPHATE IN AQUEOUS SOLUTION AT HIGH TEMPERATURES. N. N. Korobov, T. I. Kunin, and B. F. Postnikov (J. Appl. Chem. Russ., 1936, 9, 1920-1925). The content of P_2O_5 sol. in aq. NH_4 citrate after heating $Ca_3(PO_4)_2$ with aq. suspensions of SiO_2 (SiO_2 gel, quarts, emery) at 110 - 250° is considerably < with H_2O alone, but is increased when $NaHSO_4$, Na_2SO_4, Na_2CO_3, or $(NH_4)_2CO_3$ is substituted for SiO_2. R. A.



BC

B-I-8

Treatment of calcium cyanamide with phosphoric acid. V. P. Postnikov, T. I. Kunin, and A. A. Artamonova (J. Chem. Ind. Russ., 1936, 13, 1229—1231).—50% H_3PO_4 is added to $CaCN_2$ in amount sufficient to convert the entire Ca present into $Ca(H_2PO_4)_2$ (I), when the $CN{\cdot}NH_2$ liberated combines with H_2O to yield urea. Aq. NH_3 is then added, in amount corresponding with the reaction (I) + $2NH_3$ → $CaHPO_4$ + $(NH_4)_2HPO_4$, and the product is dried at 42°. The final product is readily granulable and non-hygroscopic; it contains assimilable P_2O_5 51·35, N (as urea and NH_4) 10·5—13%, and > traces of dicyanodiamide.

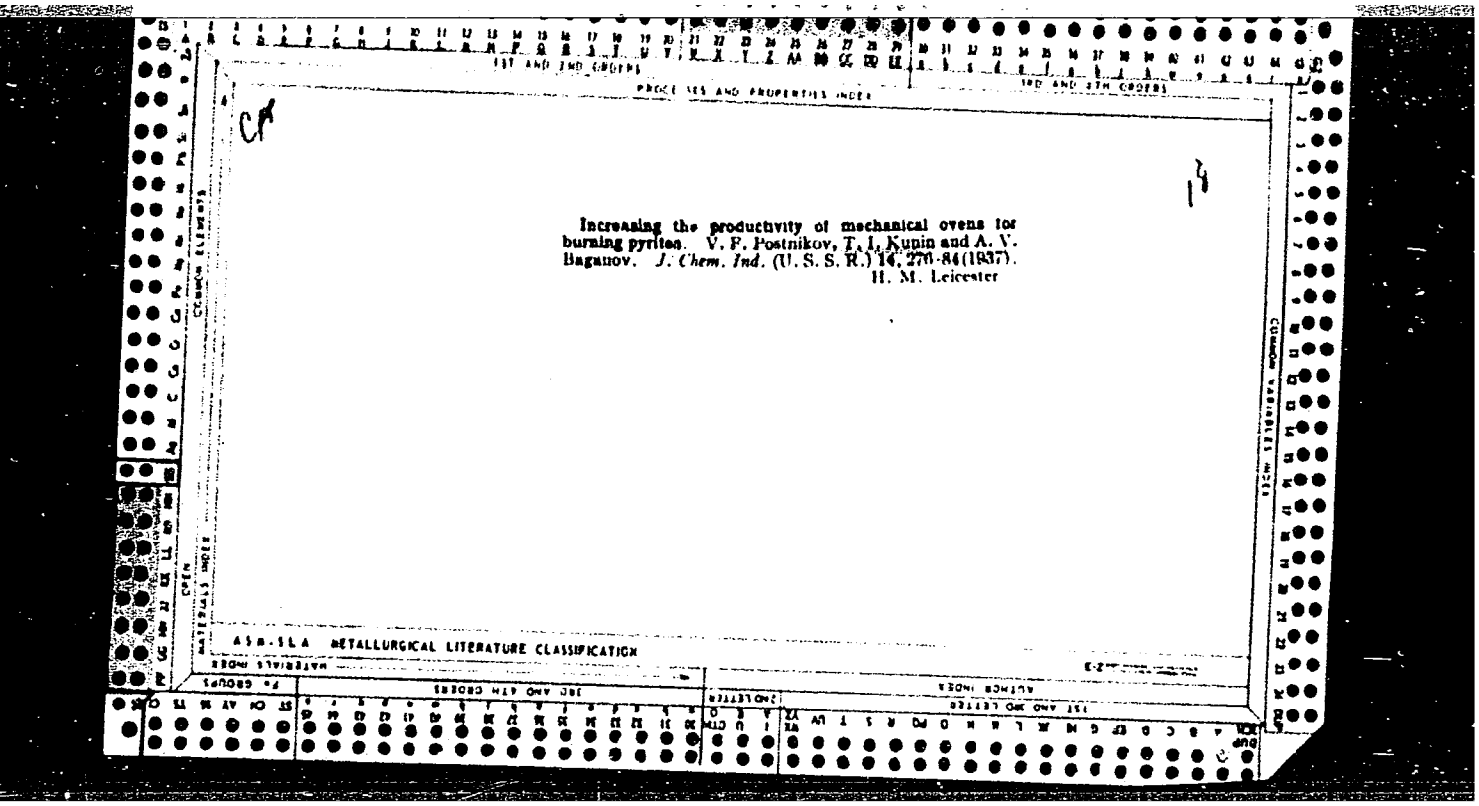
R. T.

PROCESSES AND PROPERTIES INDEX

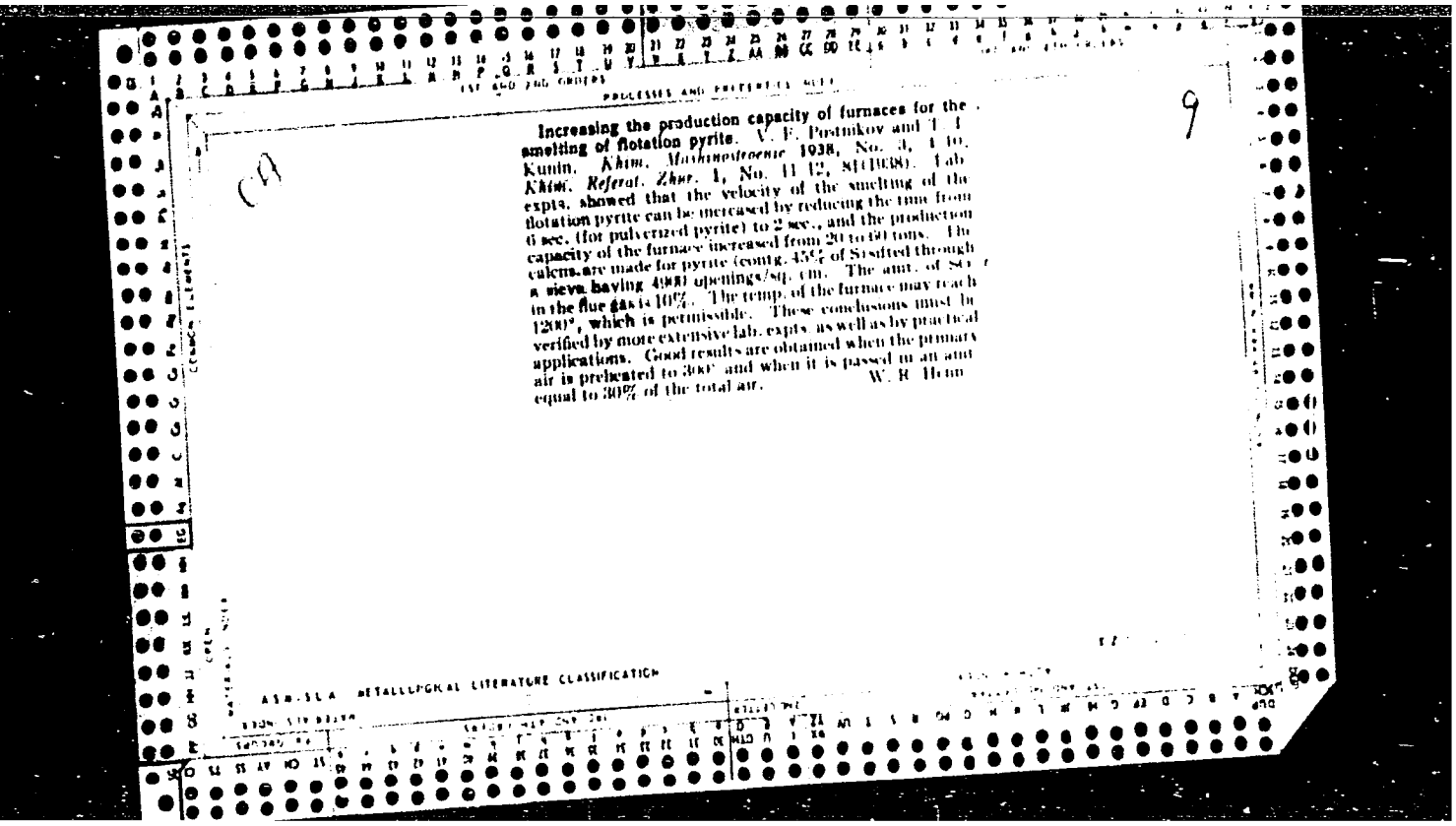
B. T. F

Constant catalytic activity of chromium oxide in oxidation of sulphur dioxide to sulphur trioxide. V. K. Pospelikov, T. L. Kunin, and A. A. Artamonova (J. Appl. Chem. Russ., 1937, 10, 1558—1559).—A reply to Adadurov's criticism (B., 1937, 778). R. T.

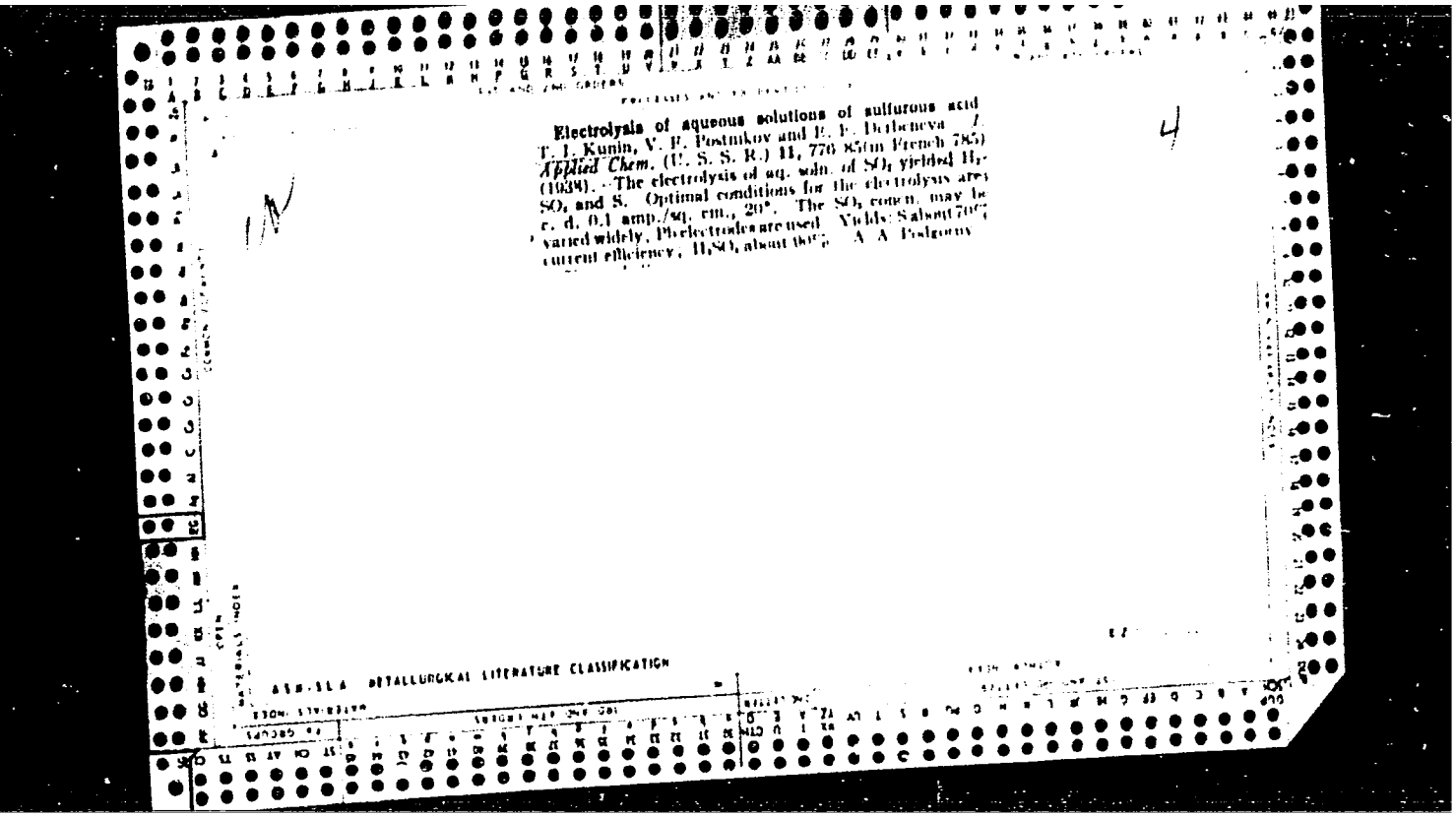
ASD-SLA METALLURGICAL LITERATURE CLASSIFICATION



Increasing the productivity of mechanical ovens for burning pyrites. V. F. Postnikov, T. I. Kupin and A. V. Baganov. *J. Chem. Ind.* (U. S. S. R.) 14, 276-84 (1937).
H. M. Leicester



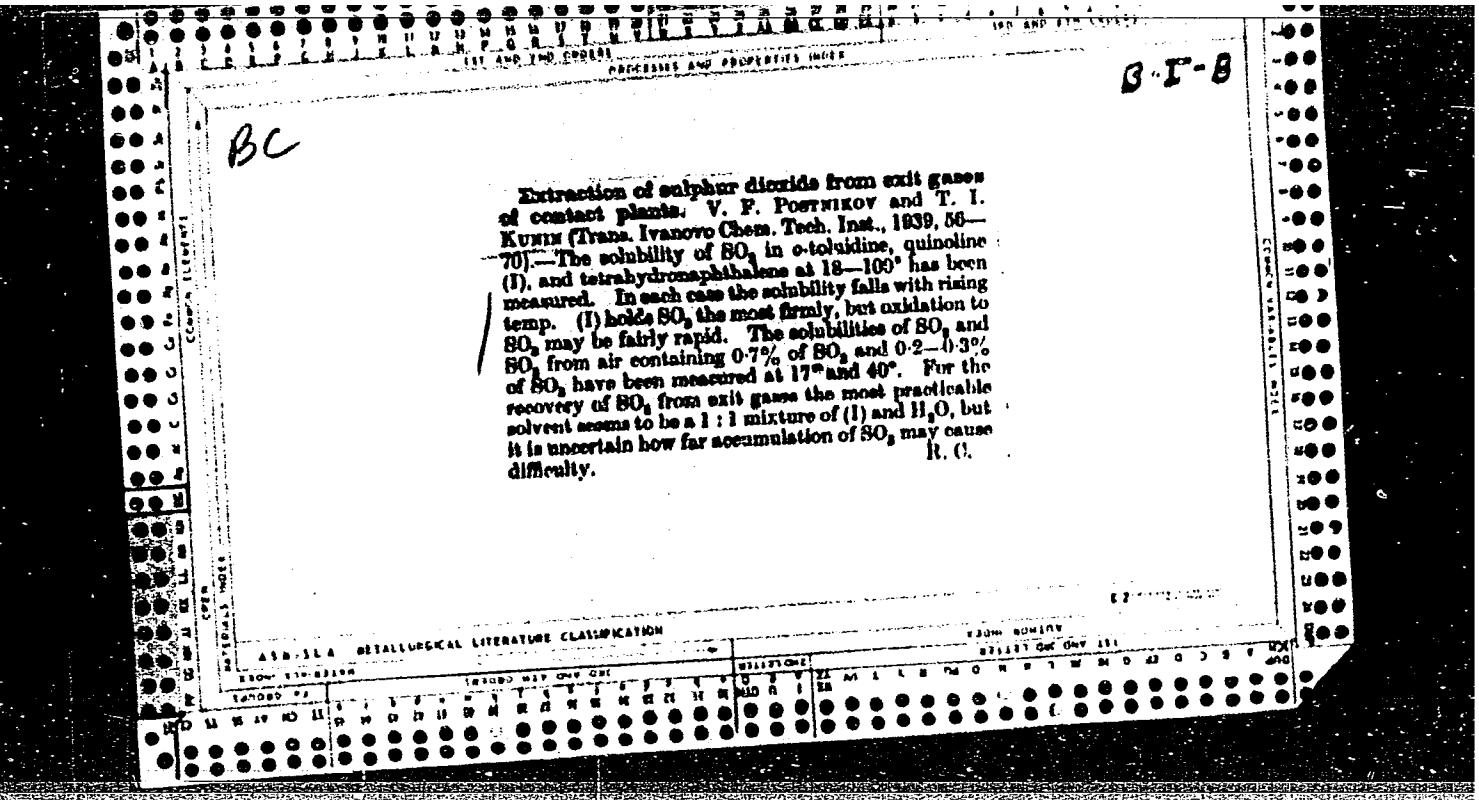
Increasing the production capacity of furnaces for the smelting of flotation pyrite. V. F. Postnikov and I. I. Kunin. *Khim. Metallurgiya* 1938, No. 3, 4-10. *Khim. Referat. Zhur.* 1, No. 11-12, 81(1938). Lab. expts. showed that the velocity of the smelting of the flotation pyrite can be increased by reducing the time from 6 sec. (for pulverized pyrite) to 2 sec., and the production capacity of the furnace increased from 20 to 60 tons. The calcns. are made for pyrite (contg. 45% of S) sifted through a sieve having 4900 openings/sq. cm. The amt. of SO$_2$ in the flue gases is 10%. The temp. of the furnace may reach 1200°, which is permissible. These conclusions must be verified by more extensive lab. expts. as well as by practical applications. Good results are obtained when the primary air is preheated to 300° and when it is passed in an amt. equal to 30% of the total air. W. R. Henn



Electrolysis of aqueous solutions of sulfurous acid
T. I. Kunin, V. F. Postnikov and P. P. Dutlenova. *J. Applied Chem.* (U. S. S. R.) 11, 770-85(in French 785) (1938).—The electrolysis of aq. soln. of SO_2 yielded H_2 SO_4 and S. Optimal conditions for the electrolysis are c. d. 0.1 amp./sq. cm., 20°. The SO_2 concn. may be varied widely. Pt electrodes are used. Yields: S about 70% current efficiency, H_2SO_4 about 100%. A. A. Balkovoy

4

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

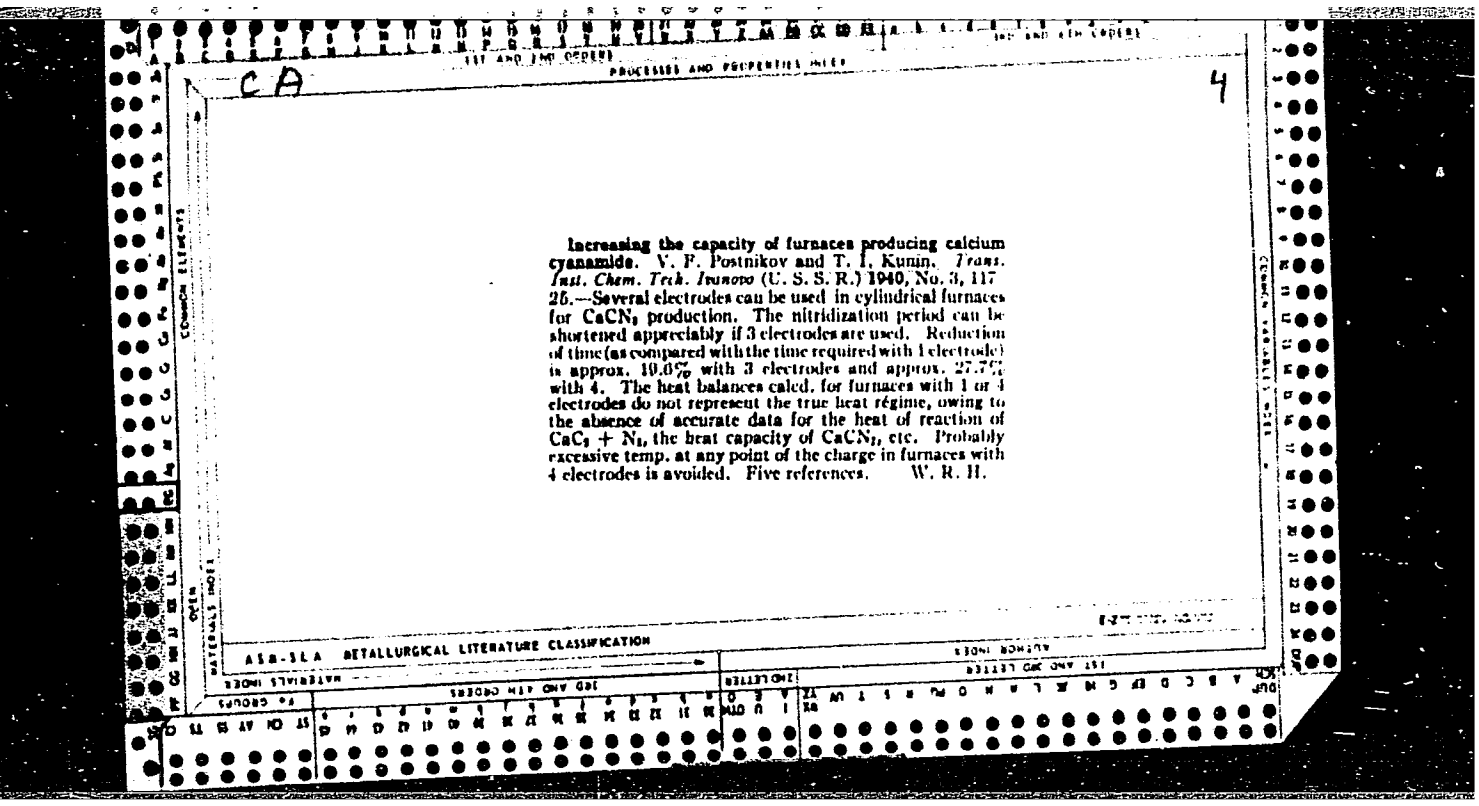


B-I-B

BC

Extraction of sulphur dioxide from exit gases of contact plants. V. F. POSTNIKOV and T. I. KUNIN (Trans. Ivanovo Chem. Tech. Inst., 1939, 56—70).—The solubility of SO_2 in o-toluidine, quinoline (I), and tetrahydronaphthalene at 18—109° has been measured. In each case the solubility falls with rising temp. (I) holds SO_2 the most firmly, but oxidation to SO_3 may be fairly rapid. The solubilities of SO_2 and SO_3 from air containing 0·7% of SO_2 and 0·2—0·3% of SO_3 have been measured at 17° and 40°. For the recovery of SO_2 from exit gases the most practicable solvent seems to be a 1 : 1 mixture of (I) and H_2O, but it is uncertain how far accumulation of SO_3 may cause difficulty.

R. C.

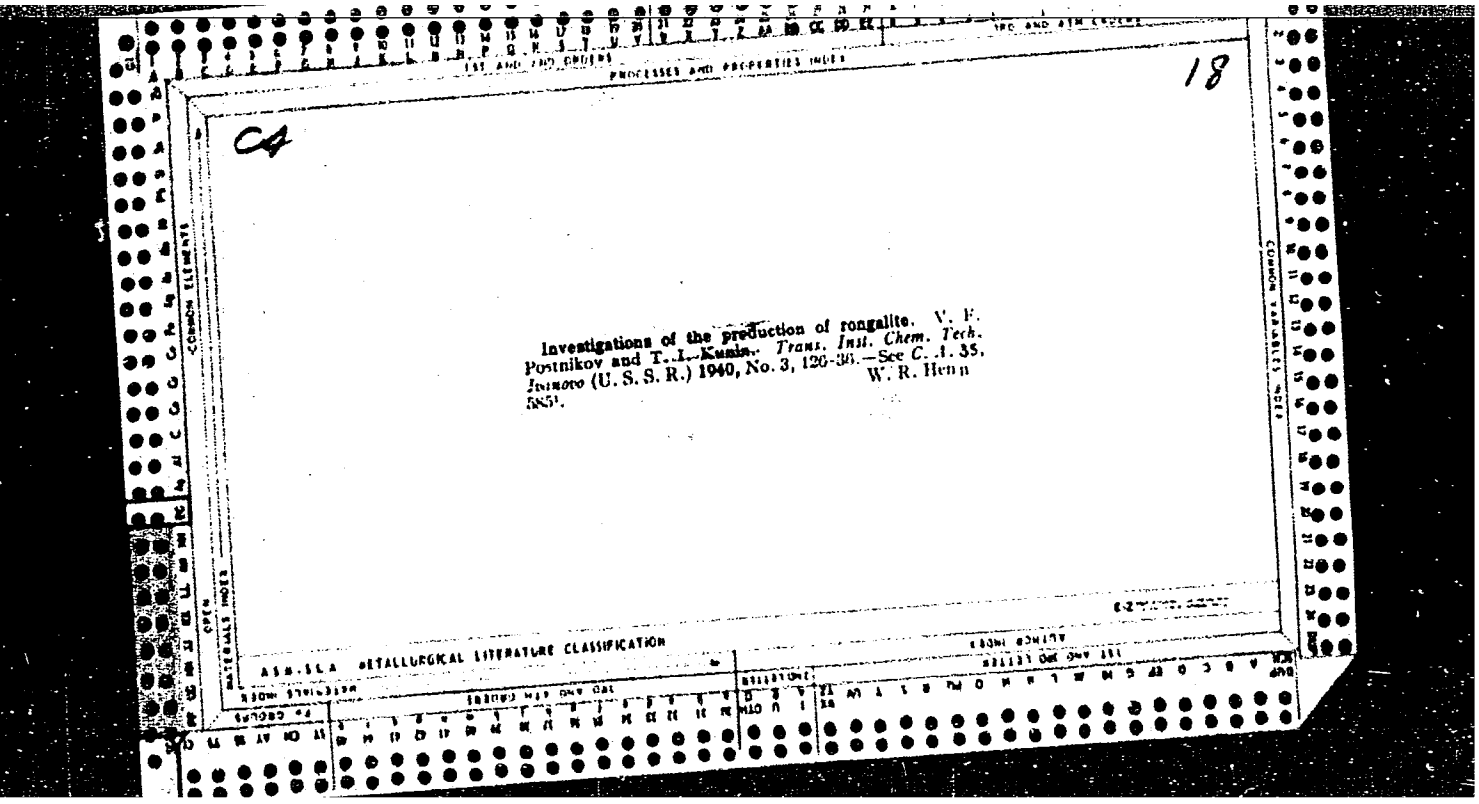


CA

4

Increasing the capacity of furnaces producing calcium cyanamide. V. F. Postnikov and T. I. Kunin. *Trans. Inst. Chem. Tech. Ivanovo* (U. S. S. R.) **1940**, No. 3, 117-26.—Several electrodes can be used in cylindrical furnaces for $CaCN_2$ production. The nitridization period can be shortened appreciably if 3 electrodes are used. Reduction of time (as compared with the time required with 1 electrode) is approx. 10.6% with 3 electrodes and approx. 27.7% with 4. The heat balances calcd. for furnaces with 1 or 4 electrodes do not represent the true heat régime, owing to the absence of accurate data for the heat of reaction of $CaC_2 + N_2$, the heat capacity of $CaCN_2$, etc. Probably excessive temp. at any point of the charge in furnaces with 4 electrodes is avoided. Five references. W. R. H.

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION



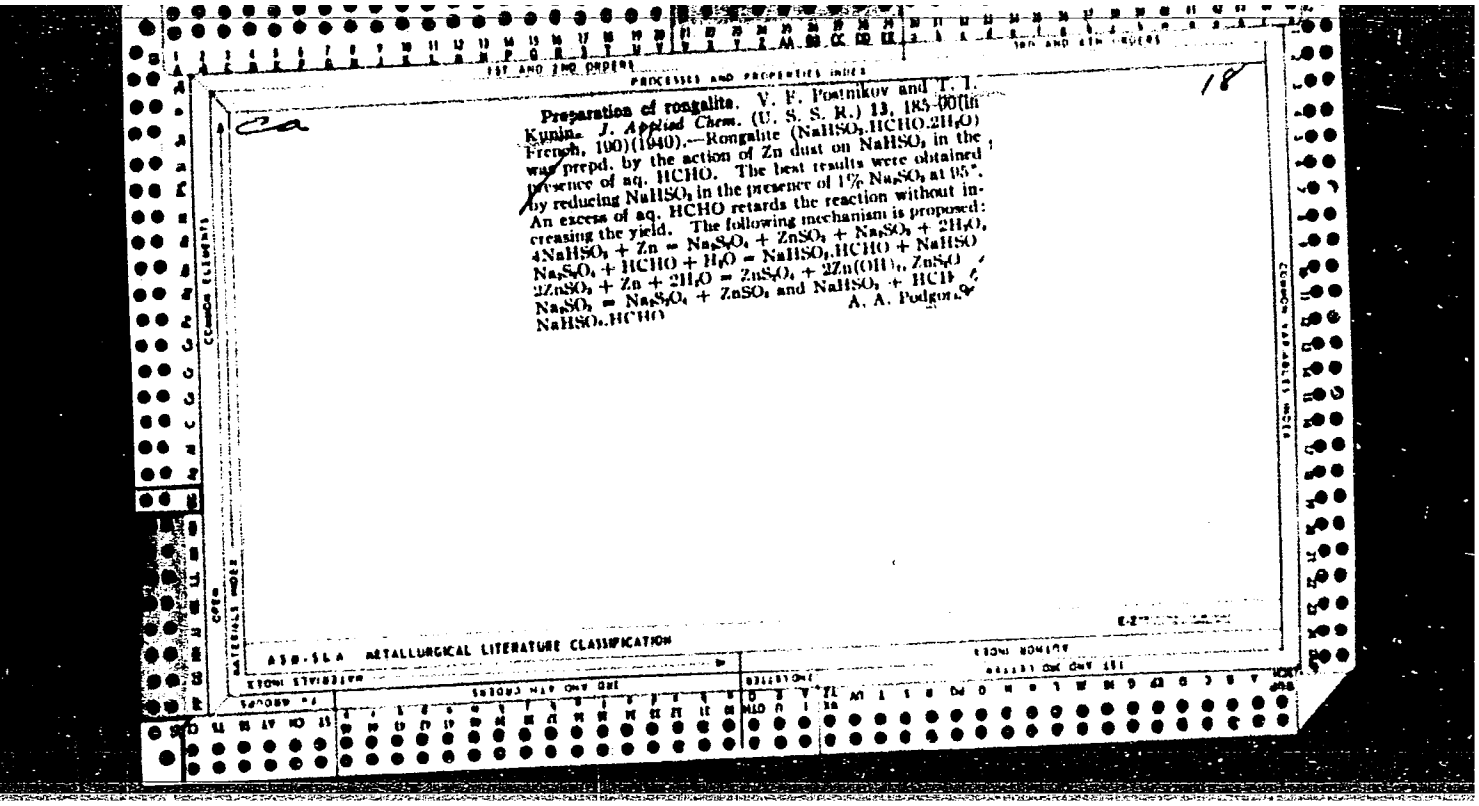
18

C4

Investigations of the production of rongalite. V. F. Postnikov and T. I. Kunia. *Trans. Inst. Chem. Tech. Ivanovo* (U. S. S. R.) 1940, No. 3, 126-36.—See *C. A.* 35, 5851.

W. R. Henn

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



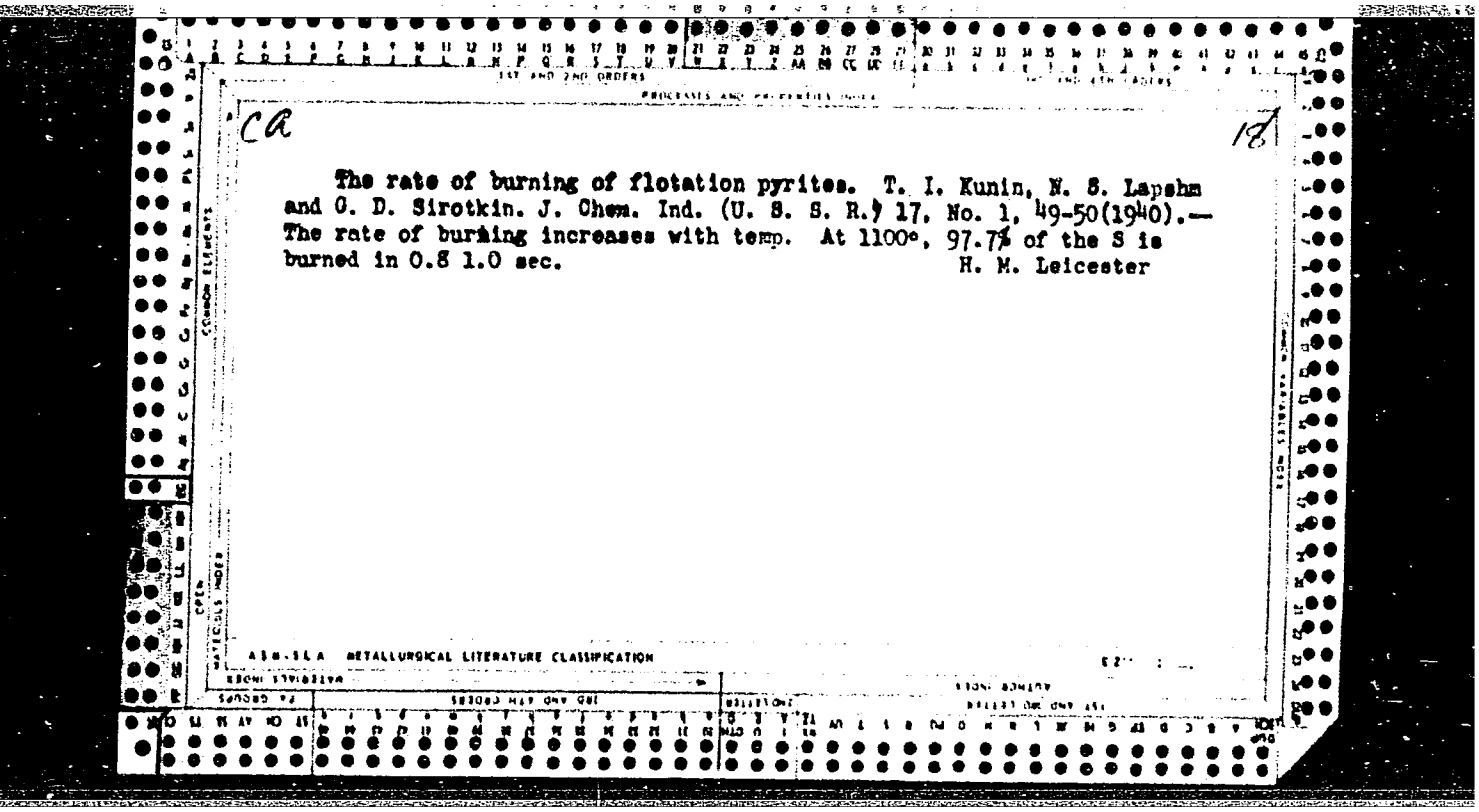
Ca

18

Preparation of rongalite. V. F. Postnikov and T. I. Kunin. *J. Applied Chem.* (U. S. S. R.) 13, 185-90[in French, 190](1940).—Rongalite ($NaHSO_2.HCHO.2H_2O$) was prepd. by the action of Zn dust on $NaHSO_3$ in the presence of aq. HCHO. The best results were obtained by reducing $NaHSO_3$ in the presence of 1% Na_2SO_3 at 85°. An excess of aq. HCHO retards the reaction without increasing the yield. The following mechanism is proposed: $4NaHSO_3 + Zn = Na_2S_2O_4 + ZnSO_3 + Na_2SO_3 + 2H_2O$, $Na_2S_2O_4 + HCHO + H_2O = NaHSO_2.HCHO + NaHSO_3$, $2ZnSO_3 + Zn + 2H_2O = ZnS_2O_4 + 2Zn(OH)_2$, $ZnSO_3$ + $Na_2SO_3 = Na_2S_2O_4 + ZnSO_3$ and $NaHSO_3$ + HCl = $NaHSO_2.HCHO$.

A. A. Podgorn[illegible]

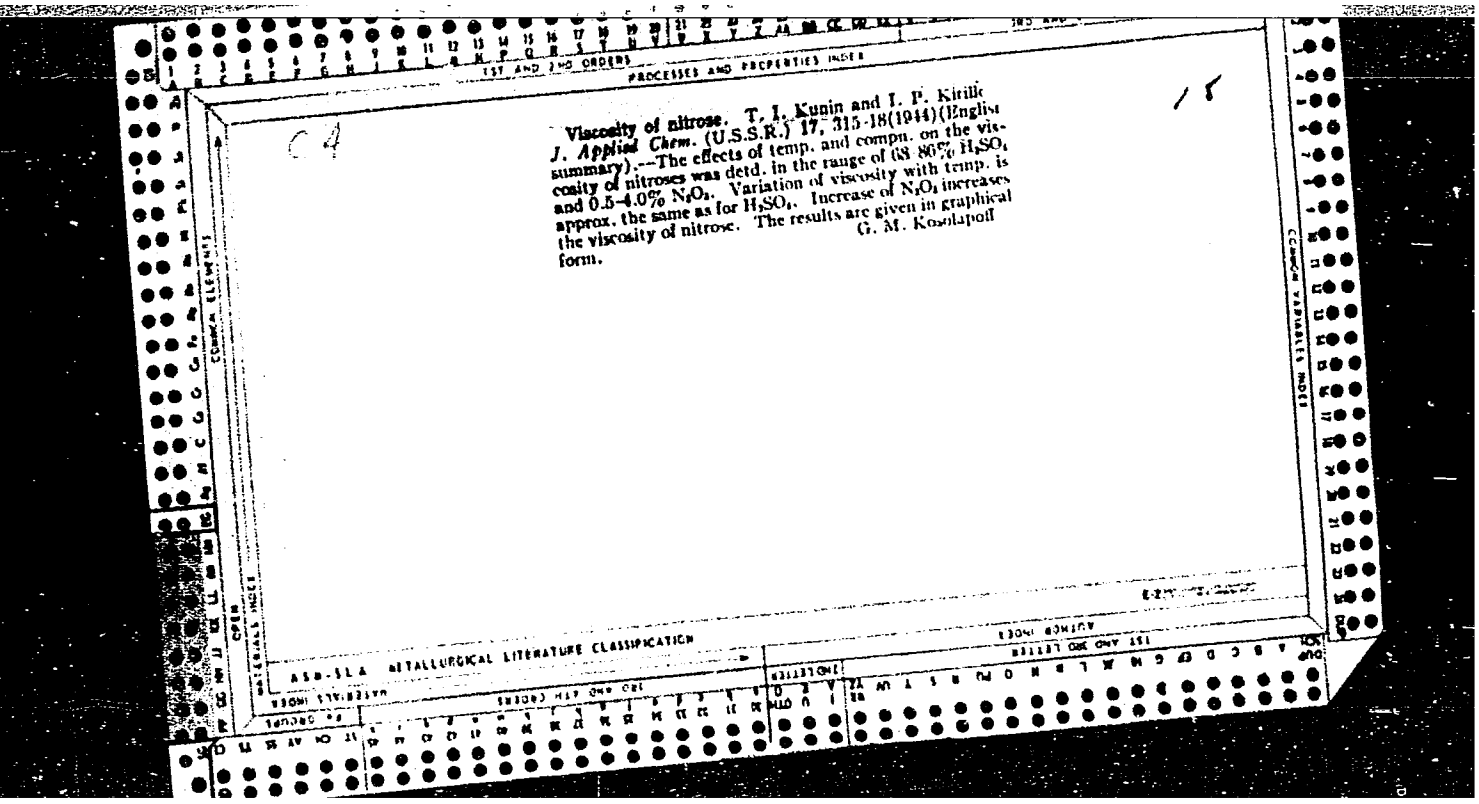
A58-SLA METALLURGICAL LITERATURE CLASSIFICATION



CA 18

The rate of burning of flotation pyrites. T. I. Kunin, N. S. Lapshm and O. D. Sirotkin. J. Chem. Ind. (U. S. S. R.) 17, No. 1, 49-50(1940).— The rate of burning increases with temp. At 1100°, 97.7% of the S is burned in 0.8 1.0 sec.

H. M. Leicester

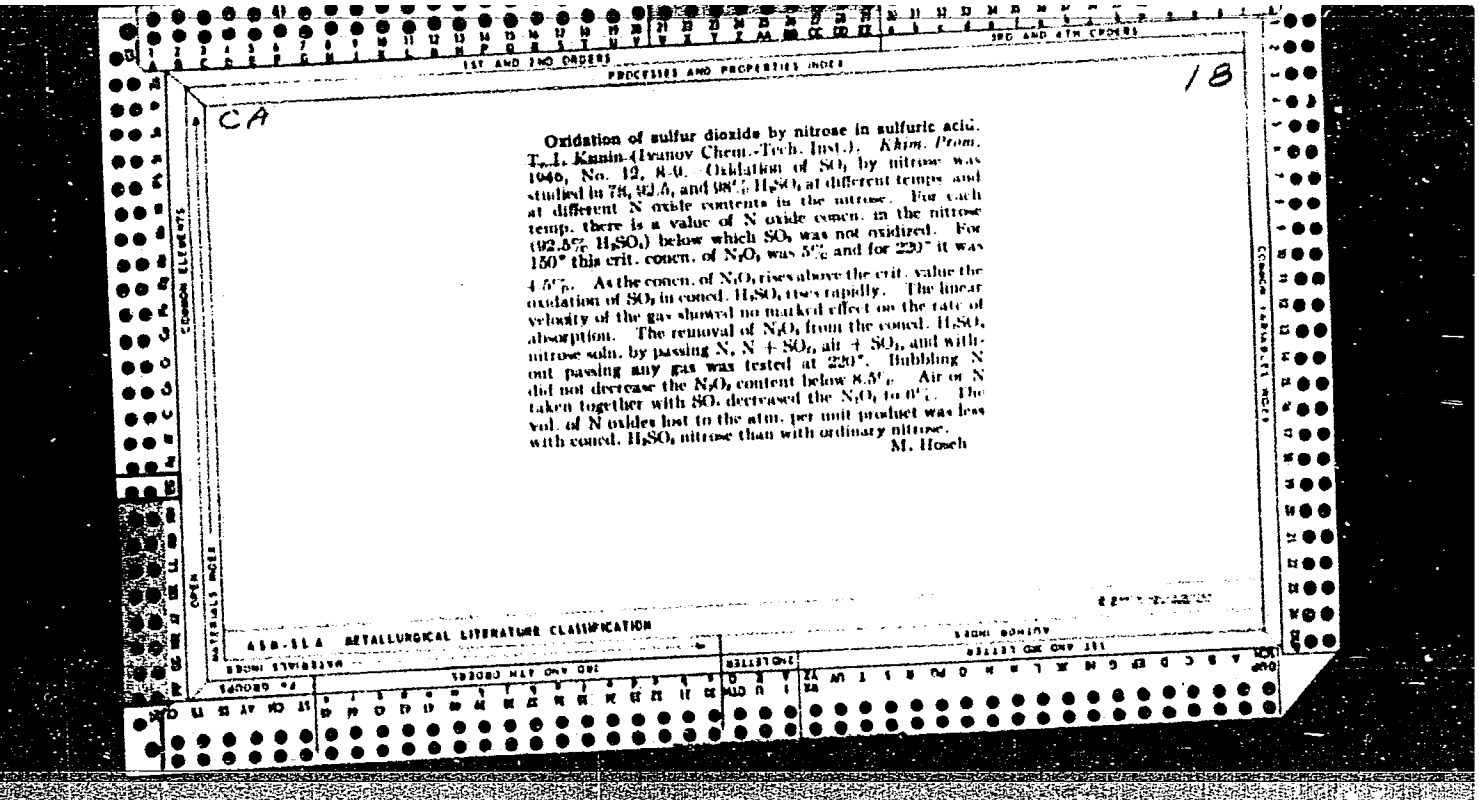


C 4

Viscosity of nitrose. T. I. Kunin and I. P. Kirilli *J. Applied Chem.* (U.S.S.R.) 17, 315-18(1944)(English summary).—The effects of temp. and compn. on the viscosity of nitroses was detd. in the range of 88-86% H_2SO_4 and 0.5-4.0% N_2O_3. Variation of viscosity with temp. is approx. the same as for H_2SO_4. Increase of N_2O_3 increases the viscosity of nitrose. The results are given in graphical form.

G. M. Kosolapoff

1 5

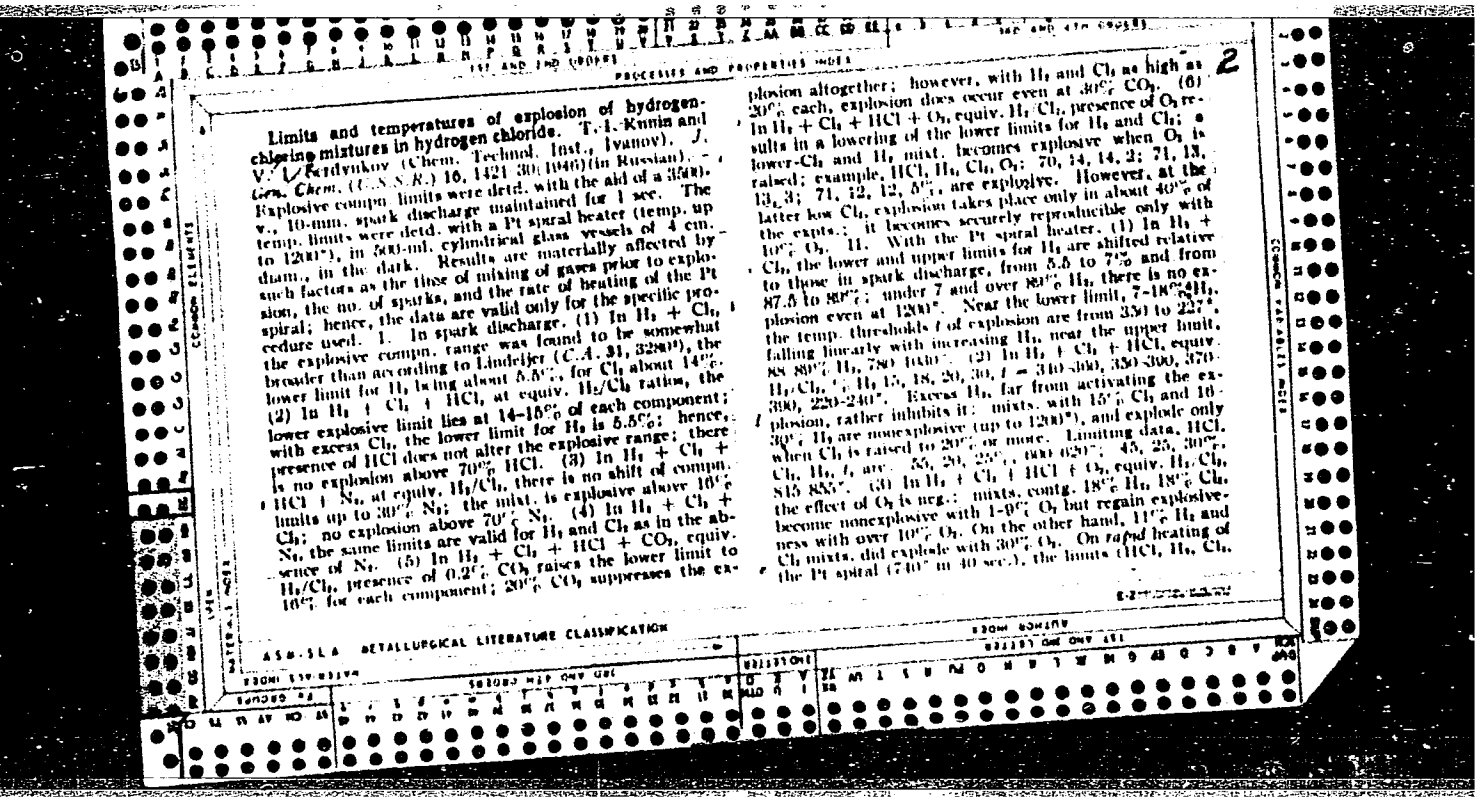


CA

18

Oxidation of sulfur dioxide by nitrose in sulfuric acid. T. I. Kunin (Ivanov Chem.-Tech. Inst.). *Khim. Prom.* 1946, No. 12, 8-9. Oxidation of SO_2 by nitrose was studied in 78, 92.5, and 98% H_2SO_4 at different temps. and at different N oxide contents in the nitrose. For each temp. there is a value of N oxide concn. in the nitrose (92.5% H_2SO_4) below which SO_2 was not oxidized. For 150° this crit. concn. of N_2O_3 was 5% and for 220° it was 4.5%. As the concn. of N_2O_3 rises above the crit. value the oxidation of SO_2 in concd. H_2SO_4 rises rapidly. The linear velocity of the gas showed no marked effect on the rate of absorption. The removal of N_2O_3 from the concd. H_2SO_4 nitrose soln. by passing N, N + SO_2, air + SO_2, and without passing any gas was tested at 220°. Bubbling N did not decrease the N_2O_3 content below 8.5%. Air or N taken together with SO_2 decreased the N_2O_3 to 0%. The vol. of N oxides lost to the atm. per unit product was less with concd. H_2SO_4 nitrose than with ordinary nitrose.

M. Hosch



Limits and temperatures of explosion of hydrogen-chlorine mixtures in hydrogen chloride. T. I. Knnin and V. V. Serdyukov (Chem. Technol. Inst., Ivanov). *J. Gen. Chem.* (*U.S.S.R.*) 16, 1421-30 (1946) (in Russian). — Explosive compn. limits were detd. with the aid of a 3500-v., 10-mm. spark discharge maintained for 1 sec. The temp. limits were detd. with a Pt spiral heater (temp. up to 1200°), in 500-ml. cylindrical glass vessels of 4 cm. diam., in the dark. Results are materially affected by such factors as the time of mixing of gases prior to explosion, the no. of sparks, and the rate of heating of the Pt spiral; hence, the data are valid only for the specific procedure used. I. In spark discharge, (1) in $H_2 + Cl_2$ the explosive compn. range was found to be somewhat broader than according to Lindeljer (*C.A.* **31**, 3280), the lower limit for H_2 being about 5.5%, for Cl_2 about 14%. (2) In $H_2 + Cl_2 + HCl$, at equiv. H_2/Cl_2 ratios, the lower explosive limit lies at 14–16% of each component; with excess Cl_2, the lower limit for H_2 is 5.5%; hence, presence of HCl does not alter the explosive range; there is no explosion above 70% HCl. (3) In $H_2 + Cl_2 + HCl + N_2$, at equiv. H_2/Cl_2, there is no shift of compn. limits up to 30% N_2; the mixt. is explosive above 10% Cl_2; no explosion above 70% N_2. (4) In $H_2 + Cl_2 + N_2$, the same limits are valid for H_2 and Cl_2 as in the absence of N_2. (5) In $H_2 + Cl_2 + HCl + CO_2$, equiv. H_2/Cl_2, presence of 0.2% CO_2 raises the lower limit to 10% for each component; 20% CO_2 suppresses the explosion altogether; however, with H_2 and Cl_2 as high as 20% each, explosion does occur even at 30% CO_2. (6) In $H_2 + Cl_2 + HCl + O_2$, equiv. H_2/Cl_2, presence of O_2 results in a lowering of the lower limits for H_2 and Cl_2; a lower-Cl_2 and H_2 mixt. becomes explosive when O_2 is raised; example, HCl, H_2, Cl_2, O_2: 70, 14, 14, 2; 71, 13, 13, 3; 71, 12, 12, 5%, are explosive. However, at the latter low Cl_2, explosion takes place only in about 40% of the expts.; it becomes securely reproducible only with 10% O_2. II. With the Pt spiral heater, (1) in $H_2 + Cl_2$, the lower and upper limits for H_2 are shifted relative to those in spark discharge, from 5.5 to 7% and from 87.5 to 89%; under 7 and over 89% H_2 there is no explosion even at 1200°. Near the lower limit, 7–18% H_2, the temp. thresholds t of explosion are from 330 to 227°, falling linearly with increasing H_2, near the upper limit, 88–89% H_2, 780–1030°. (2) In $H_2 + Cl_2 + HCl$, equiv. H_2/Cl_2, % H_2 15, 18, 20, 30, t = 310–360, 330–390, 370–390, 220–240°. Excess H_2 far from activating the explosion, rather inhibits it; mixts. with 15% Cl_2 and 10–30% H_2 are nonexplosive (up to 1200°), and explode only when Cl_2 is raised to 20% or more. Limiting data, HCl, Cl_2, H_2, t, are: 55, 20, 25%, 600 (620°); 45, 25, 30%, 815–855°. (3) In $H_2 + Cl_2 + HCl + O_2$, equiv. H_2/Cl_2, the effect of O_2 is neg.: mixts. contg. 18% H_2, 18% Cl_2, become nonexplosive with 1–9% O_2 but regain explosiveness with over 10% O_2. On the other hand, 11% H_2 and Cl_2 mixts. did explode with 30% O_2. On *rapid* heating of the Pt spiral (740° in 40 sec.), the limits (HCl, H_2, Cl_2,

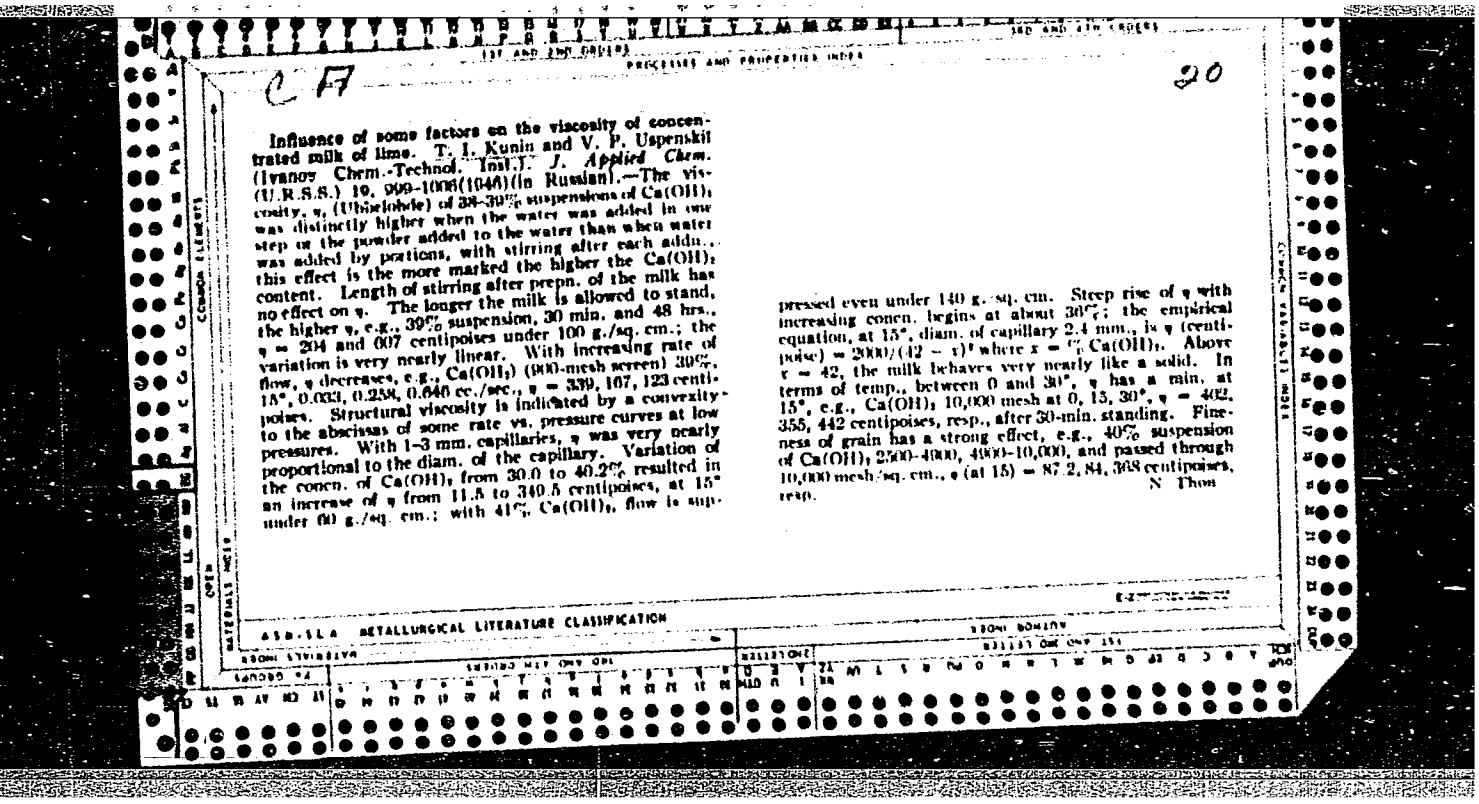
(H_2, O_2) were: 48, 11, 11, 30, 580°; (2, 14, 14, 10, 720°, 20, 12, 17, 10, 550°; the same mixts. were nonexplosive on slow heating. (4) N_2 may act as inhibitor. 15% H_2 + 15% Cl_2 becomes nonexplosive with 0.5% N_2; explosion sets in again with 10% H_2, 10% Cl_2, 0.5% N_2, 61.5% HCl, (350°); no further increase in N_2 raises gradually to 475°; with 18% N_2 explosion is suppressed but sets in again at 20% H_2 + 20% Cl_2, (480-510°, provided N_2 is not over 20%. (5) In H_2 + Cl_2 + HCl + CO_2, 0.5% CO_2 inhibits explosion at less than 20% H_2, 20% Cl_2; this mixt. is effectively inhibited by 1% CO_2; the 21 + 21 mixt. is inhibited by 10% CO_2; t = 330-380°. Wall-adsorbed CO_2 suppressed explosion in 15 + 15 and 17 + 17 mixts. (6) Drying of the gases over H_2SO_4 and P_2O_5 and rehumidifying with traces of H_2O vapor did not change the limits in spark-discharge initiation. In Pt spiral heating, dry H_2 + Cl_2 + HCl mixts.: 15 + 15 + 70, 20 + 20 + 60, and 30 + 30 + 40, proved nonexplosive and were activated by H_2O.

N. Thon

KUNIN, T. I.

"Chlorine and Hydrogen Explosion Temperatures and Limits in Hydrogen Chloride." by T. I. Kunin and V. I. Serdirkov (p. 1429)

SO: Journal of General Chemistry (Zhurnal Obshchei Khimii) 1946, Volume 16, No. 9



CF

20

Influence of some factors on the viscosity of concentrated milk of lime. T. I. Kunin and V. P. Uspenskii (Ivanov Chem.-Technol. Inst.). *J. Applied Chem.* (U.R.S.S.) 19, 999-1006(1946)(in Russian).—The viscosity, η, (Ubbelohde) of 38-39% suspensions of $Ca(OH)_2$ was distinctly higher when the water was added in one step to the powder added to the water than when water was added by portions, with stirring after each addn.; this effect is the more marked the higher the $Ca(OH)_2$ content. Length of stirring after prepn. of the milk has no effect on η. The longer the milk is allowed to stand, the higher η, e.g., 39% suspension, 30 min. and 48 hrs., η = 204 and 607 centipoises under 100 g./sq. cm.; the variation is very nearly linear. With increasing rate of flow, η decreases, e.g., $Ca(OH)_2$ (900-mesh screen) 30%, 15°, 0.033, 0.258, 0.646 cc./sec., η = 339, 107, 123 centipoises. Structural viscosity is indicated by a convexity to the abscissas of some rate vs. pressure curves at low pressures. With 1–3 mm. capillaries, η was very nearly proportional to the diam. of the capillary. Variation of the concn. of $Ca(OH)_2$ from 30.0 to 40.2% resulted in an increase of η from 11.5 to 340.5 centipoises, at 15° under 60 g./sq. cm.; with 41% $Ca(OH)_2$, flow is suppressed even under 140 g./sq. cm. Steep rise of η with increasing concn. begins at about 30%; the empirical equation, at 15°, diam. of capillary 2.4 mm., is η (centipoise) = 2000/(42 − x)² where x = % $Ca(OH)_2$. Above x = 42, the milk behaves very nearly like a solid. In terms of temp., between 0 and 30°, η has a min. at 15°, e.g., $Ca(OH)_2$ 10,000 mesh at 0, 15, 30°, η = 402, 355, 442 centipoises, resp., after 30-min. standing. Fineness of grain has a strong effect, e.g., 40% suspension of $Ca(OH)_2$ 2500–4000, 4000–10,000, and passed through 10,000 mesh/sq. cm., η (at 15) = 87.2, 84, 368 centipoises, resp.

N. Thon

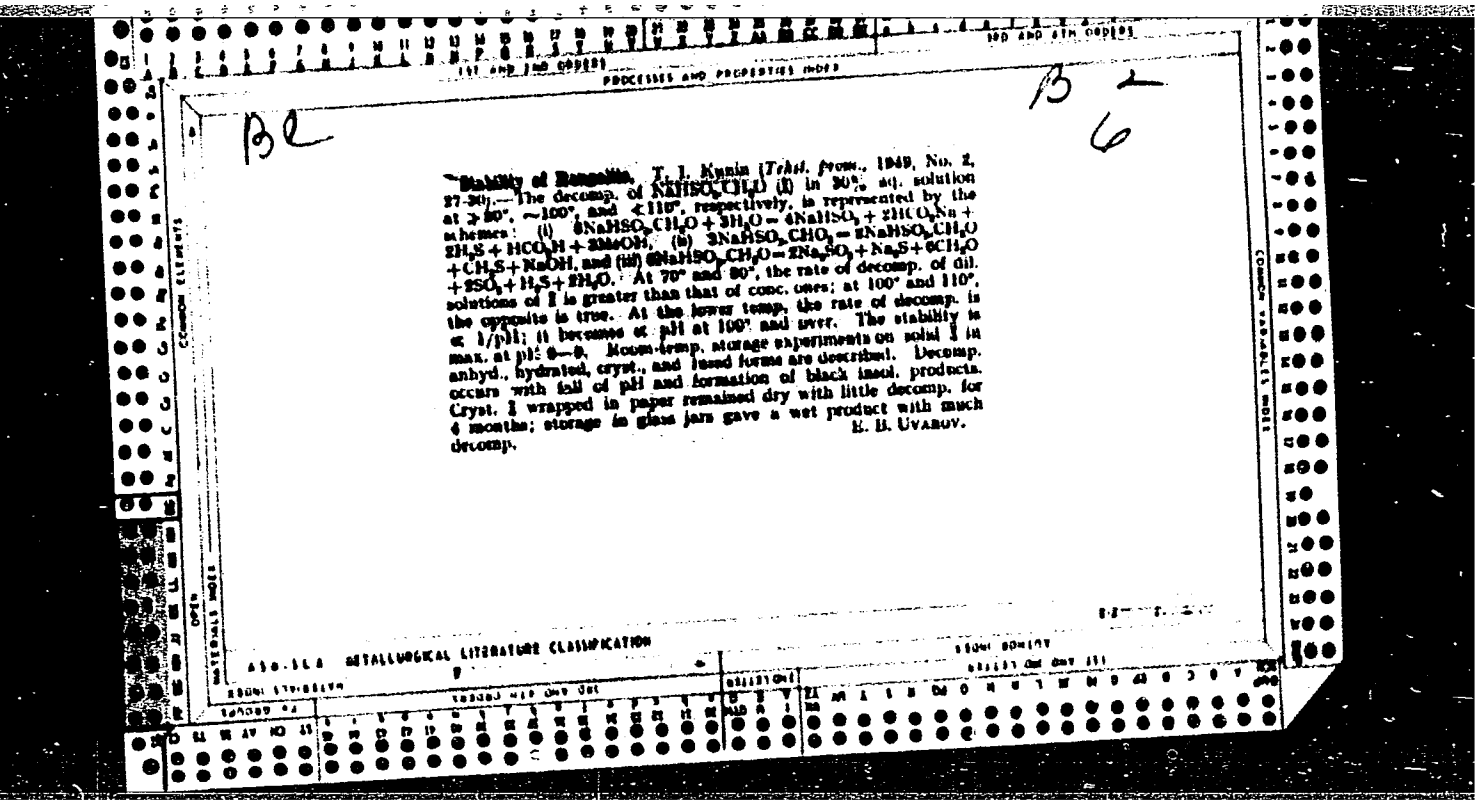
A58-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

Studies on the production of Rongalite. I. Thermal decomposition of Rongalite solutions. T. I. Kunin. *Zhur. Prikład. Khim.* (J. Applied Chem.) 21, 885-91 (1948).—The decompn. products of $NaHSO_2.HCHO.2H_2O$ (I) in aq. soln., namely $Na_2SO_3(NaHSO_3)$, $Na_2S_2O_3$, and Na_2S, as well as the unchanged original I, were detd. by complete iodometric analyses. On the basis of analytical data, the overall process in the decompn. of a 30% soln. of I at 100°, in a stream of N_2, 4–10 hrs., is $3NaHSO_2.HCHO \rightarrow 2NaHSO_3.HCHO + HCHO + NaHS$, and $NaHS + HCHO \rightarrow HCHS + NaOH$. The decompn. is accompanied by a rise of the pH, which leads to the following formulation of the component steps of the reaction: (1) $NaHSO_2.HCHO \rightleftarrows NaHSO_2 + HCHO$, (2) $3NaHSO_2 \rightarrow 2NaHSO_3 + NaHS$, (3) $NaHSO_2 + HCHO + H_2O \rightleftarrows H_2COHSH + SO_2.HCHO$, (4) $NaHS + HCHO + H_2O \rightleftarrows H_2COHSH + NaOH$, (5) $2NaHSO_2 + 2NaHSO_3 \rightarrow 2Na_2S_2O_3 + H_2O \rightarrow Na_2S_2O_3 + 2NaHSO_3$, (6) $NaHSO_2 + NaOH \rightarrow Na_2SO_3 + H_2O$, (7) $2NaHS \rightarrow Na_2S + H_2S$, and (8) $2HCHO + H_2O \rightarrow MeOH + HCO_2H$. The products contain also some amt. of mercaptans, noticeable by their odor. In the presence of H_2SO_4, the decompn. is considerably faster, and is accompanied by abundant liberation of S. The main reactions in this case are (1) as above, (2') $NaHSO_2 + H_2SO_4 \rightarrow NaHSO_4 + H_2SO_3$, (3') $2H_2SO_3 \rightarrow H_2S_2O_3 + H_2O$, and (4') $H_2S_2O_3 \rightarrow H_2O + SO_2 + S$. At 120–5°, the decompn. is accompanied by abundant evolution of HCHO. For the practice of production of I, these data mean that, in the reduction of $NaHSO_2$ to I at 100°, partial decompn. of the product will result in an increase of the alkalinity, which may stop reduction of $NaHSO_2$ by Zn and result in evolution of H_2. The favorable effect of an excess of HCHO in the production of I is due to binding of alkali by the HCO_2H formed. Continuous control of the pH is essential in the production of I. II. **Velocity and mechanism of the decomposition.** *Ibid.* 22, 199-200(1949).—In contrast to the decompn. at 100° and higher, where formation of NaOH gives rise to an increase of the pH, the reaction at 80° and lower is accompanied by an increase of the acidity. The initial pH of 15, 30, and 60% solns. was 6.15-6.45, 6.95-7.55, and 8.00-8.05, resp. At 80°, the pH drops considerably during the 1st hr. of the decompn., then levels off to a practically stationary value; the same, but with an initial increase of the pH, is observed at 100°. The consecutive-reaction scheme accounting for the overall reaction at 80° and lower, is (1) $6NaHSO_2.HCHO \rightleftarrows 6NaHSO_2 + 6HCHO$, (2) $6HCHO + 3H_2O \rightarrow 3MeOH + 3HCO_2H$, (3) $6NaHSO_2 \rightarrow 4NaHSO_3 + 2NaHS$, (4) $2NaHS + 2HCO_2H \rightarrow 2HCO_2Na + 2H_2S$, overall $6NaHSO_2.HCHO + 3H_2O \rightarrow 4NaHSO_3 + 2HCO_2Na + 2H_2S + HCO_2H + 3MeOH$. At 120°, the consecutive reactions are (1) $6NaHSO_2.HCHO \rightleftarrows 6NaHSO_2 + 6HCHO$, (2) $6NaHSO_2 \rightarrow 4NaHSO_3 + 2NaHS$, (3) $4NaHSO_3 \rightarrow 2Na_2SO_3 + 2SO_2 + 2H_2O$, (4) $2NaHS \rightarrow Na_2S + H_2S$, overall $6NaHSO_2.HCHO \rightarrow 2Na_2SO_3 + Na_2S + 6HCHO + 2SO_2 + H_2S + 2H_2O$. In the presence of H_2SO_4, the overall reaction can be written $2NaHSO_2.HCHO + H_2SO_4 \rightarrow Na_2SO_4 + 2HCHO + 2H_2O + SO_2 + S$. In agreement with the 1st scheme, the rate of decompn. at

80° and below decreases with increasing concn., e.g., at 70°, the degree of decompn. in 6 hrs. is 7 and 5% for a 15 and 60% soln., resp., and at 80°, resp., 8 and 7.7%. The reverse is found at 100° where, in 6 hrs., the degrees of decompn. of 15 and 60% solns. are 30 and 42%, resp., and at 110°, where for 30 and 60% solns., the decompn. is 53 and 71%, resp. For the temp. range at and below 80°, the rate of decompn. is $-dc/dt = kc/(pH)$, where c = concn. of I; this can be integrated in the const.-pH stationary range, and gives, for 15, 30, and 60% solns., the 1st-order consts. k = 0.043, 0.043, and 0.044 at 70°, and 0.060, 0.057, and 0.062 hr.$^{-1}$ at 80°. The reaction scheme for 100° leads to $-dc/dt = kc$ (pH), with k = 0.0007, 0.0065, and 0.0064 hr.$^{-1}$, resp. At 110°, the 1st-order k is const. only for a 30% soln., k = 0.12, but rises autocatalytically with the progress of the reaction in more concd. solns. Comparable rate consts. for all temps. are obtained in the form $k' = k/(pH)$ for the 80° range, and $k' = k(pH)$ at 100°; the values, for 15, 30, and 60% solns., are, at 70°, 0.010, 0.008, and 0.007; at 80°, 0.013, 0.010, and 0.009; at 100°, 0.05, 0.063, and 0.084 hr.$^{-1}$. The variations of k' with the concn. are in opposite directions at 70-80° and at 100°.

N. Thon



Stability of Rongalite. T. I. Kunin (*Tekst. prom.*, 1949, No. 2, 27-30).—The decomp. of $NaHSO_2CH_2O$ (I) in 30% aq. solution at $\geq 80°$, ~100°, and <110°, respectively, is represented by the schemes: (i) $6NaHSO_2CH_2O + 3H_2O = 4NaHSO_3 + 2HCO_2Na + 2H_2S + HCO_2H + 2NaOH$, (ii) $3NaHSO_2CH_2O = 2NaHSO_3CH_2O + CH_2S + NaOH$, and (iii) $6NaHSO_2CH_2O = 2Na_2SO_3 + Na_2S + 6CH_2O + 2SO_2 + H_2S + 2H_2O$. At 70° and 90°, the rate of decomp. of dil. solutions of I is greater than that of conc. ones; at 100° and 110°, the opposite is true. At the lower temp. the rate of decomp. is $\propto 1/pH$; it becomes ∞ at pH 8—9. Room-temp. storage experiments on solid I in anhyd., hydrated, cryst., and fused forms are described. Decomp. occurs with fall of pH and formation of black insol. products. Cryst. I wrapped in paper remained dry with little decomp. for 4 months; storage in glass jars gave a wet product with much decomp.

E. B. Uvarov.

CA

2

Partial pressure of nitrogen oxides and of water vapor over nitroses. T. I. Kunin and N. A. Surov (Ivanov Chem. Technol. Inst.). *Zhur. Prikład. Khim.* (J. Applied Chem.) 23, 139-9(1950).—The following data give the compn. of the nitrose (% H_2SO_4 as analyzed, % N_2O_3 as analyzed, % H_2O by the difference), and the corresponding pressures (mm. Hg) of NO + NO_2 at 138, 159, 173, and 198°: (88.0, 4.05, 7.95) 0.27, —, 1.06, and 3.75; (86.9, 5.82, 7.28) 0.33, 1.46, 4.08, and 11.94; (84.3, 8.82, 6.88) 4.33, 11.27, 22.70, and 33.90; (82.4, 10.52, 7.08) 27.60, 42.80, 51.50, and 112.2. With the compn. of the system expressed in % H_2SO_4, N_2O_3, and H_2O, i.e. with the H_2SO_4 concn. of the original acid considered const. (92.5%), the system does not obey Henry's law. If the compn. is expressed as a soln. of $HNSO_4$ in H_2SO_4, in terms of % H_2SO_4, $HNSO_4$, and H_2O, i.e. with the H_2SO_4 concn. of the original acid falling, the partial vapor pressures of H_2O over these nitroses are equal to the partial pressures of H_2O over the original acids. N. T.

CA

The partial pressure of nitrogen oxides and of water vapor over nitroses. T. I. Kupin and N. A. Surov (Ivanovo Inst. Chem. Technol.). *J. Applied Chem. U.S.S.R.* 23, 139–42(1950)(Engl. translation).—See *C.A.* 44, 8756a.
B. L. M.