PAKSHINA, YE V.

KRASNOVSKIY, A.A.; VOROB'YEVA, L.M.; PAKSHINA, Ye.V.

Studying the photochemically active form of chlorophyll in plants belonging to different systematic groups [with summary in English]. Fiziol.rast. 4 no.2:124-133 Mr-Ap '57. (MLRA 10:5)

1. Institut biokhimii im. A.N. Bakha Akademii nauk SSSR, Moskva.
(Chlorophyll)

AUTHORS: Krasnovskiy, A. A., Pakshina, Ye. V. SOV/20-120-3-40/67

TITLE: The Properties of Photoreduced Forms of Chlorophyll, Protochlorophyll and Haematoporphyrin, as Dependent Upon the Conditions of the Acid-Base Equilibrium (Svoystva fotovosstanovlennykh form khlorofilla, protokhlorofilla i gematoporfirina v svyazi s usloviyami kislotno-osnovnogo ravnovesiya)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 120, Nr 3, pp. 581-584 (USSR)

ABSTRACT: In the reaction of the reversible photoreduction of chlorophyll and of its analogues the excited molecule receives one electron from the donor molecule, a pair of ion radicals being formed by this process. This reaction is easily reversible and after the electron transfer an acid-base equilibrium is established according to the properties of the medium. The latter is connected with a subsequent proton transfer and with the formation of more stable reduced forms, which "accumulate" the energy of light quanta. An accumulation of such photoreduced pigment forms is only found in media with a certain basicity. The authors investigated the velocity of the reverse reaction of the photoreduced pigment

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SOV/20-120-3-40/67

The Properties of Photoreduced Forms of Chlorophyll, Protochlorophyll and Haematoporphyrin, as Dependent Upon the Conditions of the Acid-Base Equilibrium

forms and their absorption spectra in media with a varying basicity, in this instance proceeding from the same conceptions. For this purpose distilled pyridine and piperidine and ammonia water solution were used. An evacuated tube with a reaction mixture was illuminated by a cine-lamp with 500 Watts at 20° for the purpose of photoreduction. In a second experimental variant the base was only introduced after air had been admitted. It can be seen from Table 1 that the said reaction of chlorophyll regeneration from its photoreduced form with an absorption maximum at 520 mμ proceeds relatively slowly. After the introduction of a strong base (piperidine or ammonia) the absorption at 520 mμ drops rapidly, and the initial chlorophyll regenerates already during the first minute. A later introduction of oxygen does no longer change the absorption at 670 mμ and 520 mμ. Figure 2 shows the accelerating effect of piperidine and ammonia on the regeneration of the initial chlorophyll and of its photoreduced forms. Other experiments were conducted with the introduction of one of the mentioned bases into the reacting mixture after the reaction of photoreduction, the mixture being cooled to

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SOV/20-120-3-40/67

The Properties of Photoreduced Forms of Chlorophyll, Protochlorophyll and Haematoporphyrin, as Dependent Upon the Conditions of the Acid-Base Equilibrium

-40°, and after atmospheric oxygen had been admitted to it. In this case the said reaction was markedly accelerated. Identical experiments with phaeophytine yielded no spectral changes, which would correspond to the spectrum of the primary forms (as in Ref 4). When phenylhydrazine was used for the reduction, the r-th form is produced, which after the addition of a few drops of piperidine is immediately transformed into chlorophyll. Thus it is just the bases which have an effect upon the reaction power of the reduced pigment forms. There are 4 figures and 7 references, 6 of which are Soviet.

ASSOCIATION: Institut biokhimii im. A. N. Bakha Akademii nauk SSSR (Institute of Biochemistry imeni A. N. Bakh, AS USSR)

PRESENTED: January 2, 1958, by A. N. Terenin, Member, Academy of Sciences, USSR

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SOV/20-120-3-40/67

The Properties of Photoreduced Forms of Chlorophyll, Protochlorophyll and Haematoporphyrin, as Dependent Upon the Conditions of the Acid-Base Equilibrium

SUBMITTED: January 16, 1958

1. Chlorophylls--Photochemical reactions 2. Chlorophylls --Properties 3. Porphyrins--Properties 4. Acid-base equilibrium

Card 4/4

PAKSHINA, Ye.V.; KRASNOVSKIY, A.A.

Study of the pheophytinization of chlorophyll, bacteriochlorophyll, bacterioviridin, protochlorophyll and the effect of light on this reaction. Biokhimiia 29 no.6:1132-1142 N-D '64.

(MIRA 18:12)

1. Institut biokhimii imeni A.N.Bakha AN SSSR, Moskva. Submitted May 14, 1964.

KRASNOVSKIY, A.A.; PAKSHINA, Ye.V.

Comparative study of the formation of pheophytins from chlorophyll and its analogs in the dark and in light. Dokl. AN SSSR 148 no.4:935-938 F '63. (MIRA 16:4)

1. Institut biokhimii im. A.N. Bakha AN SSSR. 2. Chlen-korrespondent AN SSSR (for Krasnovskiy).
(Pheophytins)

L 33235-65 EWG(j)/EWG(r)/EWT(l)/FS(v)-3/EWG(v)/EWG(a)/EWG(c) Pe-5 DD

ACCESSION NR: AP5002265 S/0218/64/029/006/1132/1142

31

AUTHOR: Pakshina, Ye. V.; Krasnovskiy, A. A.

30

2 B

TITLE: Investigation of the pheophytinization of chlorophyll, bacteriochlorophyll, bacterioviridine, and protochlorophyll, and the effect of light on this reaction

SOURCE: Biokhimiya, v. 29, no. 6, 1964, 1132-1142

TOPIC TAGS: plant pigment, pheophytin, chlorophyll, chlorophyll analog, light effect, pheophytinization, photopheophytinization, pH

ABSTRACT: Pheophytinization rates of chlorophyll and its analogs were investigated in aqueous alcohol, aqueous acetone, and aqueous pyridine solutions with different pH values produced by the addition of oxalic acid or hydrochloric acid. Pheophytinization rates were determined by absorption spectra with SF-5 and SF-10 spectrophotometers. Light effect on the pheophytinization reaction was investigated in a vacuum in Tunberg tubes to avoid photooxidation reactions. A lamp with a condenser and a KS-11 red light filter producing an intensity of 3×10^5 ergs/cm^2.sec was used. Findings

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ACCESSION NR: AP5002265

show that, on the basis of the pheophytinization reaction rates found for chlorophyll and its analogs, the pigments can be arranged in the following decreasing order: bacterioviridine, chlorophyll a, protochlorophyll and bacteriochlorophyll, and chlorophyll b. The reaction rate is not related to reduction of the "semi-isolated" double bonds of the pigment molecule, but is significantly affected by the electronegative substitutes of the pyrrole nuclei in the molecule. The rapid pheophytinization rate of bacterioviridine, in whose molecule the cyclopentane ring is modified and the carbomethoxy group in the C_{10} position is absent, attests to the stabilizing effect of this radical on the magnesium bond in the pigment molecule. A comparison of the pheophytinization rates for chlorophylls a and b and the chlorophyllides obtained from them shows that the presence or absence of phytol does not significantly affect the strength of the magnesium bond. Light accelerated the pheophytinization of chlorophylls a, b and protochlorophyll in aqueous pyridine solutions. Possibly the mechanism of "photopheophytinization" differs from that of "dark" pheophytinization. Compounds which inhibit the photoreduction of chlorophyll (carotene, naphthacene, methyl red, safranine, and riboflavin) also inhibit photopheophytinization. Photopheophy-

L 33235-65

ACCESSION NR: AP5002265

tinization may be related to the intermediate photoreduction of chlorophyll. Orig. art. has: 4 figures and 2 tables.

ASSOCIATION: Institut biokhimii im. A. N. Bakha Akademii nauk SSSR, Moscow (Biochemistry Institute of the Academy of Sciences, SSSR)

SUBMITTED: 14May64 ENCL: 00 SUB CODE: LS

NR REF SOV: 006 OTHER: 019

Card 3/3

KRASNOVSKIY, A.A.; DROZDOVA, N.N.; PAKSHINA, Ye.V.

Effect of carotene on photochemical properties of chlorophyll.
Biokhimiia 25 no.2:288-295 Mr-Ap '60. (MIRA 14:5)

1. Institut biokhimii im. A.N.Bakha Akademii nauk SSSR, Moskva.
(CAROTENE) (CHLOROPHYLL)

Pashkina Ye. V.

KRASNOVSKIY, A.A.; PASHKINA, Ye. V.

Effect of acid-base equilibrium on the properties of photoreduced forms of chlorophyll, protochlorophyll and hematoporphyrin. Dokl. AN SSSR 120 no. 3:581-584 My '58. (MIRA 11:7)

1. Institut biokhimii im. A.N.Bakha AN SSSR. Predstavleno akademikom A.N.Tereninym.

(Chlorophyll)
(Protochlorophyll)
(Hematoporphyrin)

PAKSHINA, YE. V., UMRIKHIN, A. V., BRIN, G. P., VOROBYEVA, L. M., DROZDOVA, N. N., YEROKHIN, YU. YE., KRASNOVSKY, A. A. (USSR)

"Different Forms of Chlorophyll and its Analogues and their Role in Processes of Photochemical Electron (or Hydrogen) Transfer."

Report presented at the 5th International Biochemistry Congress, Moscow, 10-16 August 1961

17 (3)

AUTHORS: Krasnovskiy, A. A.; Pakshina, Ye. V. SOV/20-127-4-53/60

TITLE: The Photochemical and Spectral Properties of Bacterioviridin of Green Sulphur Bacteria

PERIODICAL: Doklady Akademii nauk SSSR, 1959, Vol 127, Nr 4, pp 913 - 916 (USSR)

ABSTRACT: The bacteria mentioned in the title contain a green pigment - bacterioviridin (or chlorobium-chlorophyll) instead of bacteriochlorophyll, contrary to purple bacteria. It was to be expected that the great shift of the maximum of bacterioviridin into the i.-r. side (as in the case of bacteriochlorophyll) can be explained by the aggregation of pigment molecules in ordered structures. In the present paper the authors investigated the properties mentioned in the title in cells of living bacteria, in solid films, and in colloidal and genuine solutions. Absorption spectra of a bacterial suspension. The measurements in aqueous solutions (Fig 1) agree with those described earlier (Refs 5, 6). With a 50% glycerin-content of the medium an additional maximum appears at 670 mμ in addition to the dominating maximum at

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The Photochemical and Spectral Properties of
Bacterioviridin of Green Sulphur Bacteria

SOV/20-127-4-53/60

730 mμ (in accordance with Ref 7). It seems to correspond to
the "monomeric" form of the pigment. A disaggregating effect
of glycerin cannot be assumed. Absorption spec-
tra of genuine, colloidal solutions
and solid (crystalline) films. A pure
pigment separated from a culture of Chlorobium limicola has an
absorption spectrum similar to that of chlorophyll a. By pour-
ing a few drops of the concentrated acetonic pigment solution
into an excess of distilled water a colloidal solution is
formed. Figure 1 shows the spectra. Fluorescence
spectra (Yu. Yerokhin and I. Fedorovich took part in the
measurements) were measured with freezing down to -150 accord-
ing to a method already described (Ref 9). The monomeric (dis-
solved) as well as the aggregated forms of pigment are fluo-
rescent. Further thorough investigations are still to be car-
ried out. Photochemical properties.
Similarly to chlorophyll a the pigment can be photoreduced
by ascorbic acid or sodium sulfide (as electron donors) in
pyridinic solution; the difference is that in this case more

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The Photochemical and Spectral Properties of Bacterioviridin of Green Sulphur Bacteria SOV/20-127-4-53/60

products of irreversible reduction are formed as in the case of chlorophyll a (Fig 2). In the presence of the oxygen of the air quick photochemical oxidation takes place in organic solvents (as bacteriochlorophyll). The pigment is more resistant in colloidal solutions and aqueous suspensions (Refs 1,2). Photosensitizing effect. The reactions of the photochemical transfer of hydrogen are similarly sensitized in solution by the pigment as by chlorophyll. The azo dye methyl-red is irreversibly photoreduced by the colloids of bacterioviridin and bacteriochlorophyll as well as by bacterial suspensions in the presence of ascorbic acid if they are illuminated by a spectral part which is near the i.-r.-region. V. N. Shaposhnikov and Ye. N. Kondrat'yeva, Kafedra mikrobiologii MGU imeni Lomonosova (Chair of Microbiology of Moscow State University imeni Lomonosov) provided the Chlorobium lamicula culture. There are 4 figures and 14 references, 10 of which are Soviet.

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The Photochemical and Spectral Properties of Bacterioviridin of Green Sulphur Bacteria SOV/20-127-4-53/60

ASSOCIATION: Institut biokhimii im. A. N. Bakha Akademii nauk SSSR (Institute of Biochemistry imeni A. N. Bakh of the Academy of Sciences, USSR)

PRESENTED: June 14, 1959, by A. N. Terenin, Academician

SUBMITTED: March 26, 1959

Card 4/4

KRASNOVSKIY, A.A.; PAKSHINA, Ye.V.

Reversible photoreduction of bacteriochlorophyll and its participation in the processes of photochemical electron transfer. Dokl. AN SSSR 135 no.5:1258-1261 D '60. (MIRA 13:12)

1. Institut biokhimii im.A.N.Bakha AN SSSR. Predstavleno akademikom A.N.Tereninym.

(CHLOROPHYLL) (BACTERIA, AUTOTROPHIC)
(OXIDATION-REDUCTION REACTION)

Abs Jour : Ref Zhur - Biol., No 3, 1958, 10353

Author : Krasnovskiy, A.A., Vorob'yeva, L.M., Pakshina, Ye.V.

Inst : Institute of Biochemistry, Academy of Sciences USSR

Title : **Investigation of the Photochemically Active Form of Chlorophyll in Plants of Various Systematic Groups.**

Orig Pub : **Fiziol. rasteniy, 1957, 4, No 2, 124-133**

Abstract : **Using as subjects of research plants of various systematic groups the absorption spectra in the red area of the spectrum and the kinetics of chlorophyll bleaching were investigated over the whole of the vegetation period. A detailed method of acquiring "green solutions" is given, as are measurements of the kinetics of bleaching and of the absorption spectra. Chlorophyll bleaching after irradiation with intense red light varied within the limits of 1-30%,**

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nied by displacement of the maximum into the long-wave part. In June and July there was 20-30% bleaching in the sugar beet, while it was only 3-6% in September and October. The project was completed in the Institute of Biochemistry, Academy of Sciences USSR.

Card 2/2

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S/020/63/148/004/025/025
B144/B186

27.1110

AUTHORS: Krasnovski, A. A., Corresponding Member AS USSR,
Pakshina, Ye. V.

TITLE: Comparative study of the formation of pheophytins from chlorophyll and its analogs in the dark and on exposure to light

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 4, 1963, 935-938

TEXT: Chlorophyll a and b, protochlorophyll, bacteriochlorophyll and bacterioviridin were converted to pheophytins by treating their ethereal solutions with aqueous solutions of HCl or oxalic acid. The reaction was studied spectrometrically in acetone and pyridine, both containing 10% water. The effect of light (10^4 erg/cm^2·sec) was investigated in vacuo to prevent secondary photooxidation. At 22°C and with 10^{-5} mole/l pigment and $2\cdot10^{-2}$ mole/l oxalic acid, the time (in min) needed for the half-conversion of the Mg complex in the dark was:

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	acetone	pyridine
	(both containing 10% water)	
bacterioviridin	0.5	25
chlorophyll a	4	240
protochlorophyll	25	>400
bacteriochlorophyll	25	>400
chlorophyll b	105	>400

In acetone the reaction rates differ widely. They prove to be independent of the degree of reduction of the "half-isolated" double bonds in the initial pigment. The rapid pheophytinization of bacterioviridin may be due to the absence of the cyclopentanone ring. The effect of light was studied in aqueous acetone solution in the presence of $2 \cdot 10^{-2}$ - $2 \cdot 10^{-3}$ mole/l oxalic acid at room temperature and at -20°C. While no effect at all was observed in acetone, pheophytinization of bacterioviridin was rapid in pyridine, but not accelerated more than in the dark. Photopheotynization of chlorophyll a and b and protochlorophyll was completed in pyridine containing $2 \cdot 10^{-2}$ mole/l oxalic acid within 10-15 min and in pyridine containing 10% water and 1% HCl within 40-50 min. It is suggested that

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Comparative study of the formation ...

labile photoreduction products form with pyridine or oxalic acid owing to their electron-donor properties. To verify the expected inhibition by electron-acceptors or polyenes, tests were made with addition of methyl red, carotene and naphthacene. These compounds inhibited the photoreaction in concentrations of 10^{-3} - 10^{-5} mole/l independently of the acid used but did not affect pheophytinization in the dark. Owing to the vacant electron pairs at the N of the pyrrole rings the hydrogen ions are bound before Mg is driven out; but it is still unclear whether the incorporation of the protons proceeds in one or more stages. Photopheophytinization which has been observed only in the absence of stable photoreduction products is inhibited by the same substances as photoreduction and is probably the cause of reversible photoreduction. There are 2 figures and 1 table.

ASSOCIATION: Institut biokhimii im. A.N. Bakha Akademii nauk SSSR (Institute of Biochemistry imeni A.N. Bakh of the Academy of Sciences USSR)

SUBMITTED: October 15, 1962

Card 3/3

86847

5.4500 1206, 1273, 1153, also 3612

S/020/60/135/005/042/043
B016/B052

AUTHORS: Krasnovskiy, A. A. and Pakshina, Ye. V.

TITLE: Reversible Photoreduction of Bacteriochlorophyll and Its Participation in Processes of Photochemical Electron Transfer

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 5, pp. 1258-1261

TEXT: The authors describe the formation of active photoproducts in the photoreduction of bacteriochlorophyll (from Rhodopseudomonas palustris) and the interaction between these products and electron acceptor molecules taking part in the biochemical electron transfer of photosynthesis. Bacteriochlorophyll was submitted to a final chromatographic purification (Ref. 4). The photoreactions in pyridine and water were conducted in special Tunberg tubes in which measurements with Beckmann and СФ-4 (SF-4) spectrophotometers were possible. The electron donor typical of bacterial photosynthesis of Na_2S was used. The solution was evacuated by shaking for 30-60 sec and exposed to light near the infrared region. As a result,
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Reversible Photoreduction of Bacteriochlorophyll and Its Participation in Processes of Photochemical Electron Transfer

S/020/60/135/005/042/043
B016/B052

the absorption maximum of bacteriochlorophyll at 780 mμ dropped rapidly, while the maximum of the photoreduced form appeared at 660 mμ (Fig. 1). In the dark, this reaction became automatically reverse, and at room temperature bacteriochlorophyll is almost completely regenerated within a few minutes. Regeneration sets in immediately on exposure to air (Fig. 2) The authors believe that an extraordinarily active photoreduced form of pigment and a photooxidized form of electron donor are formed, probably in accordance with the elementary process of $X + SH^- \rightleftarrows \cdot X + \cdot SH$ (X - molecule of bacteriochlorophyll). They also studied the potential of a platinum electrode during exposure to light of the following types of pigment in pyridine with an addition of Na_2S: chlorophyll a, bacteriochlorophyll, and bacterioviridine. The potentials of the three pigments were very similar (Fig. 3): During exposure to light, the potential changes by approximately 0.1 v in the negative direction. In the dark, the potential returned to its original value within 1 - 2 minutes. The authors assume that all three pigments form electron-active photoreduced products of the same type. In previous papers (Ref. 7) it was found that photoreduced pigments do not accumulate in the ternary system (electron donor -

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Reversible Photoreduction of Bacteriochlorophyll and Its Participation in Processes of Photochemical Electron Transfer

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B016/B052

chlorophyll - electron acceptor), since they rapidly react with electron-acceptor molecules. However, when the reduction of these molecules is "sensitized", the photoreduced form of the sensitized pigment starts to accumulate. Hence, the authors conclude that the absence of visible photochemical changes of a sensitized pigment in the ternary system indicates a rapid reaction of the electron-acceptor molecule with the photoreduced form of pigment. Using this comparatively sensitive method the authors tested the action of the following co-factors of photosynthetic phosphorylation: Menadione, phenazine metasulfate, and riboflavin (flavin mononucleotide). Hence, they concluded that all of the three last-mentioned substances can receive electrons from the photoreduced form of chlorophyll. These experiments on similating systems prove that the above co-factors take part in the reactions of electron transfer if they are sensitized by a system of pigments (Ref. 9). The authors recommend the explanation of such elementary processes with the help of living photosynthesizing bacteria in which bacteriochlorophyll mainly appears in aggregated and ordered forms (Ref. 10). There are 4 figures and 10 references: 8 Soviet and 2 US.

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86847

Reversible Photoreduction of Bacteriochlorophyll and Its Participation in Processes of Photochemical Electron Transfer

S/020/60/135/005/042/043
B016/B052

ASSOCIATION: Institut biokhimii im. A. N. Bakha Akademii nauk SSSR (Institute of Biochemistry imeni A. N. Bakh of the Academy of Sciences USSR)

PRESENTED: July 6, 1960, by A. N. Terenin, Academician

SUBMITTED: May 9, 1960

Card 4/4

DOMAN, N.G.; KRASNOVSKIY, A.A.; ROMANOVA, A.K.; VOROB'YEVA, L.M.; PAKSHINA, Ye. V.; TERENT'YEVA, Z.A.

Chlorophyll synthesis and carbon dioxide fixation in etiolated barley seedlings during exposure to light. Fiziol. rast. 8 no.1:3-12 '61. (MIRA 14:3)

1. A.N. Bakh Institute of Biochemistry, U.S.S.R. Academy of Sciences, Moscow.

(Chlorophyll) (Photosynthesis)

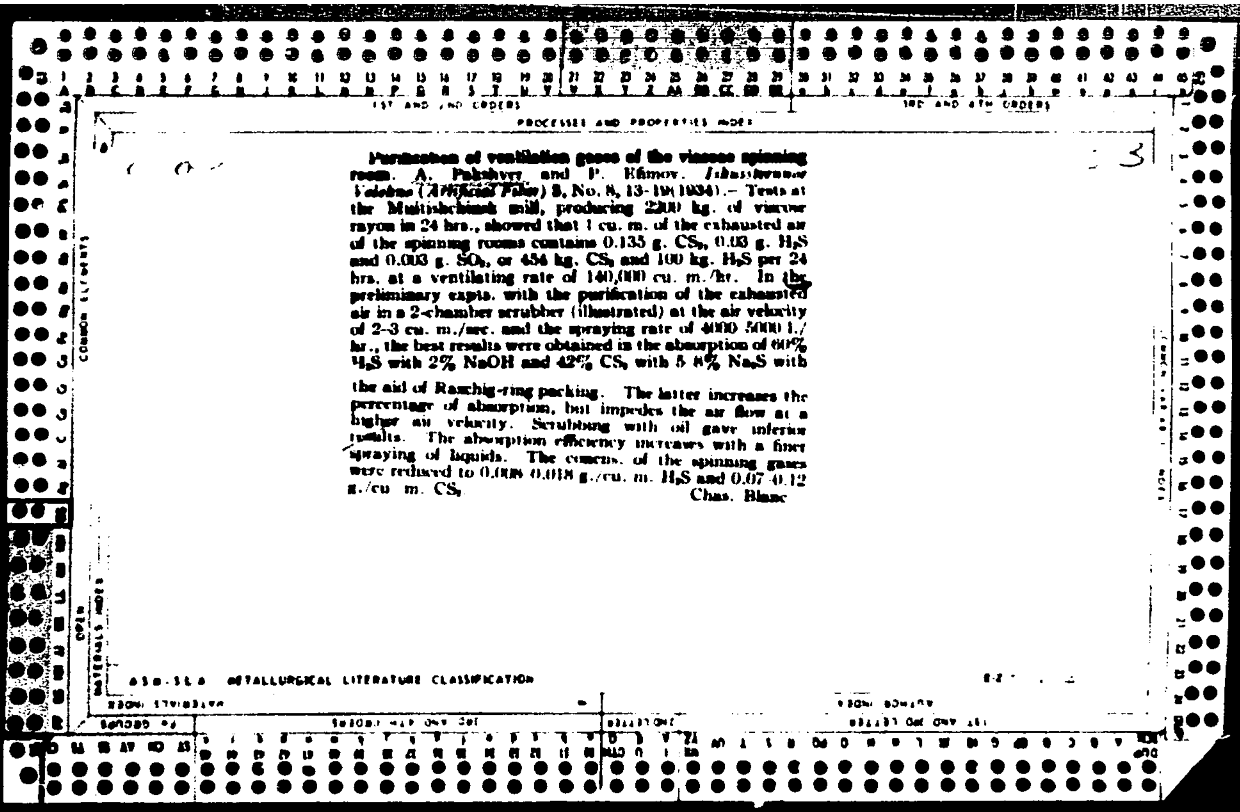
ALEKHIN; BORISOV; VOLKOV; GRIGOR'YANTS; GRUZDEV; DICH; DUSKEYEVA;
LAVRUSHIN; LOPINSKIY; IVANOVA,; KONKIN; MEOS; MIKHAYLOV;
MOGILEVSKIY; PAKSHVER; ROGOVIN; TAIROV; SHIFRIN

Deserving workers of the synthetic fibers industry. Khim. volok. no.3:79 '61. (MIRA 14:6)
(Birger, Georgii Efimovich, 1886-)

PROCESSES AND PROPERTIES INDEX

Hydraulics of viscous liquids. A. Pakshver and M. Danin. Khim. Mashinostroenie 1934, No. 4, 7-12.—An exptl. study was made of the hydraulic qualities of collodion in relation to its structure and a study of the flow of collodion in pipes. The deformation of collodion causes an appreciable thixotropy. Variation of temp. has a considerable effect upon the tenacity but little effect upon the elasticity of collodion. Variation of collodion concn. affects both the elasticity and the tenacity. A curve showing the relation of velocity of collodion flow to loss of pressure is similar to the Bingham curve but does not coincide with it because of the existence of thixotropy. The distribution of velocities during flow is approx. parabolic. Walter P. Ericks

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



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Purification of ventilation gases of the viscose spinning room. A. Pakshver and P. Klimov. *Iskusstvennoe Volokno (Artificial Fiber)* **5**, No. 8, 13-19(1934).—Tests at the Mytishchinsk mill, producing 2200 kg. of viscose rayon in 24 hrs., showed that 1 cu. m. of the exhausted air of the spinning rooms contains 0.135 g. CS_2, 0.03 g. H_2S and 0.003 g. SO_2, or 454 kg. CS_2 and 100 kg. H_2S per 24 hrs. at a ventilating rate of 140,000 cu. m./hr. In the preliminary expts. with the purification of the exhausted air in a 2-chamber scrubber (illustrated) at the air velocity of 2-3 cu. m./sec. and the spraying rate of 4000-5000 l./hr., the best results were obtained in the absorption of 60% H_2S with 2% NaOH and 42% CS_2 with 5-8% Na_2S with the aid of Raschig-ring packing. The latter increases the percentage of absorption, but impedes the air flow at a higher air velocity. Scrubbing with oil gave inferior results. The absorption efficiency increases with a finer spraying of liquids. The concns. of the spinning gases were reduced to 0.008-0.018 g./cu. m. H_2S and 0.07-0.12 g./cu. m. CS_2.

Chas. Blanc

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-5

Methods of recovery of viscose-precipitating baths. A. Pakshver and M. Margulis. *Iskusstvennoe Volokno* (*Artificial Fiber*) 5, No. 8, 46-52(1934).—The influence of time and temp. on the glucose contents of pptg. baths in the process of recovery by evapn. was studied by refluxing mixts. of H_2SO_4, Na_2SO_4, $ZnSO_4$ and glucose in various proportions within ±1° at 60°, 80° and 107° for 3 and 6 hrs. Heating below 100° for 6 hrs. has practically no effect on the glucose contents, while boiling for 6 hrs. decomposes 13% glucose. The problem of crystn. and drying of sulfate pptd. in recovery of pptg. baths by evapn. was studied with mixts. of H_2SO_4, Na_2SO_4, $(NH_4)_2SO_4$ and $ZnSO_4$ and H_2SO_4, Na_2SO_4, $MgSO_4$ and $ZnSO_4$. The results show that only pure $Na_2SO_4.10H_2O$ is crystd. out and that no double salts with Mg or NH_4 salts are formed. The crystn. of Na_2SO_4 from the Mg bath proceeds more difficultly and at lower temps. than from the NH_4 bath. $Na_2SO_4.10H_2O$ must be dried at high temps. (not over 240°) regardless of the method of drying. C. Blanc

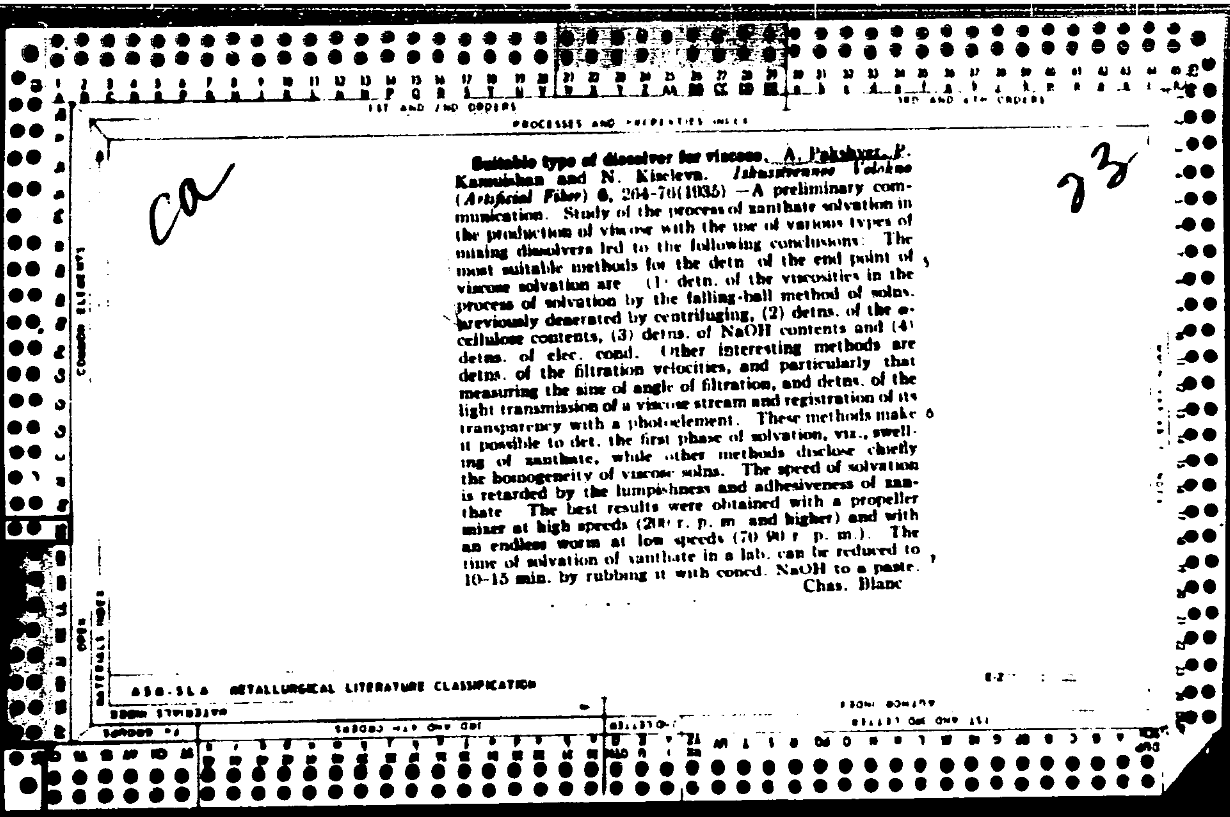
ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CR

The action of solutions of nitrocellulose on different materials S. I. Sklyarenko and A. B. Pakshver. *J. Chem. Ind.* (Moscow) 1934, No. 7, 47-50; cf. *C. A.* 28, 7530.—Sn, Al, acid-resisting steels and those contg. a large amt. of C are only slightly or not at all corroded by EtOH-Et_2O or EtOH-Me_2CO solns. of nitrocellulose. Fe, Cu, Pb, Zn, bronze and steel contg. little C are corroded by such solns. The action is due entirely to traces of H_2SO_4 and HNO_3 in the nitrocellulose and is increased somewhat by the presence of increased amts. of H_2O. Nitrocellulose itself exerts a protective action against the corrosion.

H. M. Leicester

METALLURGICAL LITERATURE CLASSIFICATION



Suitable type of dissolver for viscose. A. Pakshver, P. Kamaishan and N. Kiseleva. *Iskusstvennoe Volokno* (*Artificial Fiber*) 6, 264-70(1935).—A preliminary communication. Study of the process of xanthate solvation in the production of viscose with the use of various types of mixing dissolvers led to the following conclusions: The most suitable methods for the detn. of the end point of 5 viscose solvation are (1) detn. of the viscosities in the process of solvation by the falling-ball method of solns. previously deaerated by centrifuging, (2) detns. of the α-cellulose contents, (3) detns. of NaOH contents and (4) detns. of elec. cond. Other interesting methods are detns. of the filtration velocities, and particularly that measuring the sine of angle of filtration, and detns. of the light transmission of a viscose stream and registration of its transparency with a photoelement. These methods make 6 it possible to det. the first phase of solvation, viz., swelling of xanthate, while other methods disclose chiefly the homogeneity of viscose solns. The speed of solvation is retarded by the lumpishness and adhesiveness of xanthate. The best results were obtained with a propeller mixer at high speeds (200 r. p. m. and higher) and with an endless worm at low speeds (70-90 r. p. m.). The time of solvation of xanthate in a lab. can be reduced to 7 10-15 min. by rubbing it with concd. NaOH to a paste.

Chas. Blanc

CA

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Centrifugal or bobbin method of (viscose) spinning. A. Pakshvr. Org. Chem. Ind. (U. S. S. R.) 1, 461-5 ([illegible]).—In the preliminary communication the advantages and disadvantages of the 2 methods are discussed.

Chas. Blanc

PROCESSES AND PROPERTIES INDEX

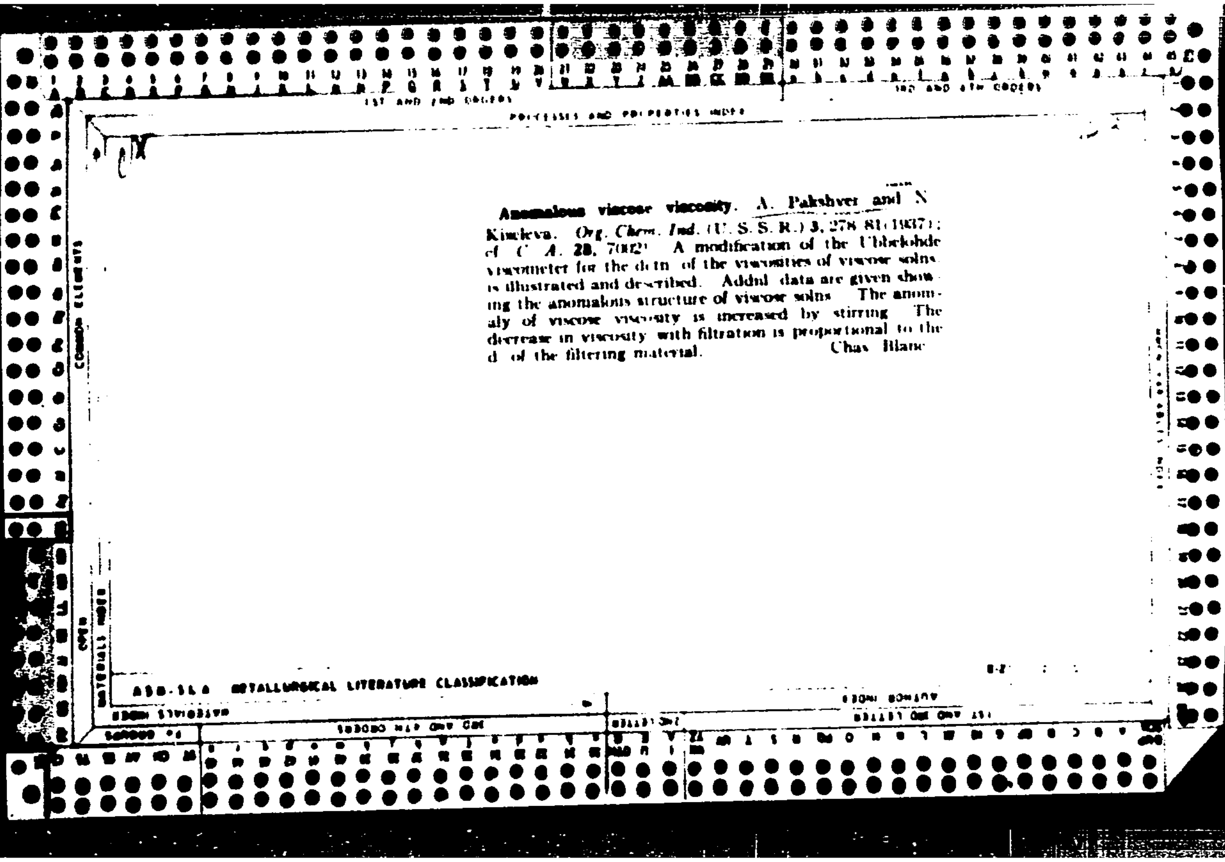
6-II-6

RECONSTRUCTION OF VISCOSE RESERVOIRS. A. Pakshver and N. Kamlschan (Prom. Org. Chim., 1937, 3, 76—79).

The rate of rise of air bubbles in viscose saturated with air conforms to that calc. from Stokes' law. The effect of reducing the pressure over the viscose is to remove dissolved air from the upper layers, and to increase the size of the bubbles, thereby increasing the velocity of ascent; the diameter of the bubbles progressively diminished as they approach the surface, owing to dissolution in the de-aerated upper layers. The final result of applying a vac. is to yield a non-homogeneous product, with respect to saturation with air.

B.T.

A.S.M.-S.L.A. METALLURGICAL LITERATURE CLASSIFICATION



Anomalous viscose viscosity. A. Pakshver and N. Kiseleva. *Org. Chem. Ind.* (U. S. S. R.) **3**, 278-81(1937); cf. *C. A.* **28**, 7002. A modification of the Ubbelohde viscometer for the detn. of the viscosities of viscose solns. is illustrated and described. Addnl. data are given showing the anomalous structure of viscose solns. The anomaly of viscose viscosity is increased by stirring. The decrease in viscosity with filtration is proportional to the d. of the filtering material.

Chas. Blanc

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

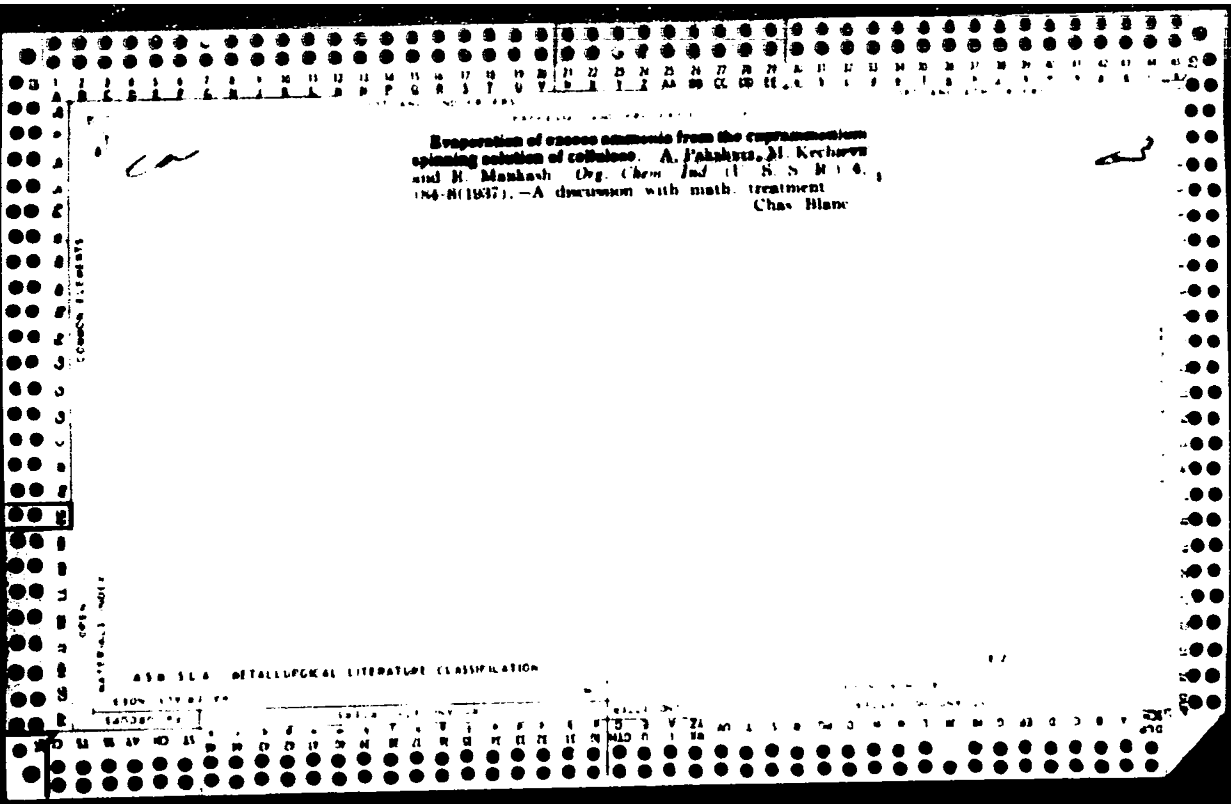
CA

3

Regeneration of viscose-precipitating bath. A. Pakshver, M. Margulis and N. Kamyshan. *Org. Chem. Ind.* (U. S. S. R.) 4, No. 13, 4-8(1937).—Various Soviet exptl. and factory procedures are discussed, with math. treatment. Chas. Blanc

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

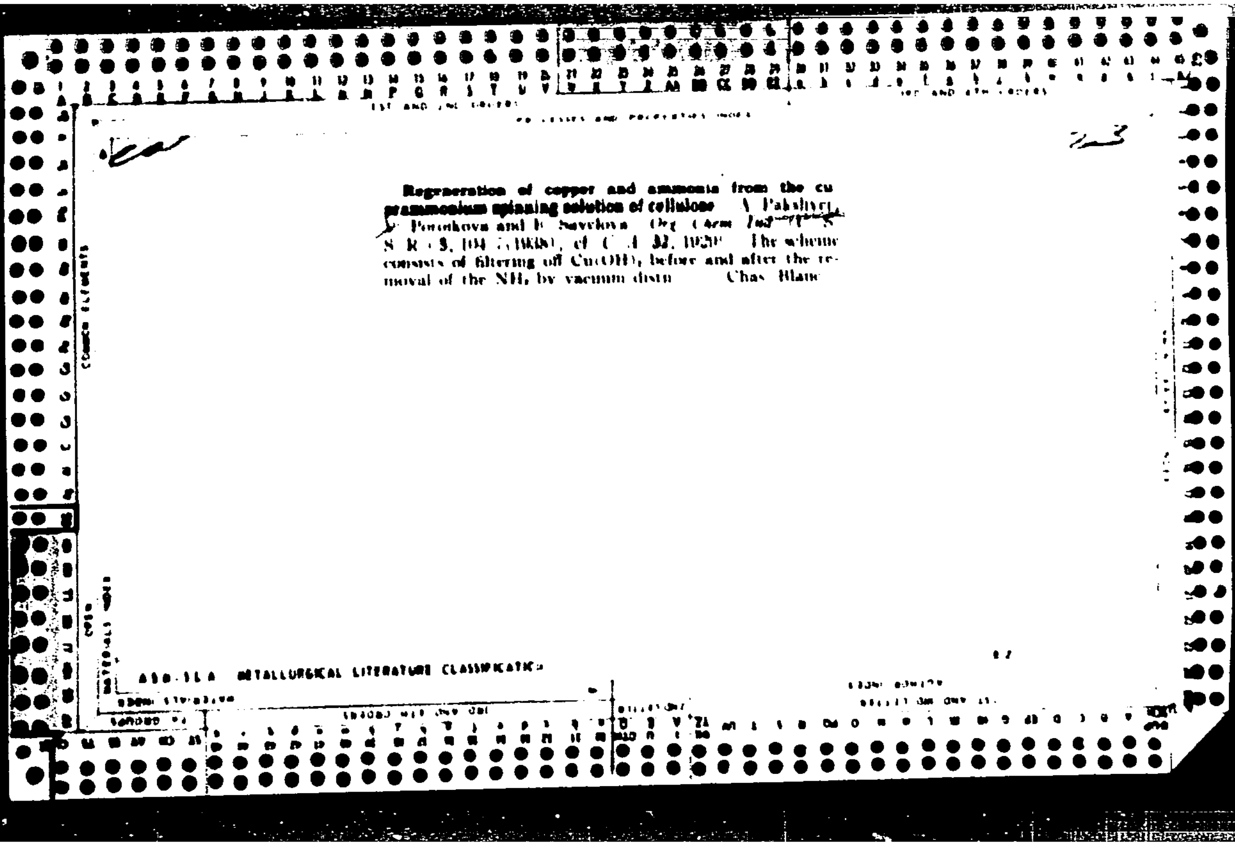
Reconstruction of the viscose aging cellar A. Pakshver and N. Kamyshan. *Org. Chem. Ind.* (U.S.S.R.) 4, 2(1937); cf. C. A. 31, 7644⁹. Samples of viscose were withdrawn from various parts of vats in the process of aging at definite storage temp. (± 5°) and then tested by the Kamishan method (C. A. 30, 6550⁷) to det. the homogeneity of the spinning solns. in relation to the temps. and viscosities. The results revealed that the temp. of viscose in different parts of vats varies throughout the ntire period of aging (0 10 hrs. for 10 1°) and causes uneven ripening and viscosities. The method of temp. conditioning of aging cellars is considered unpractical. The economical procedure of the temp. regulation, permitting individual treatment of vats, is by aging the viscose solns. in water-jacketed vats fitted with mech. stirrers. Chas. Blanc



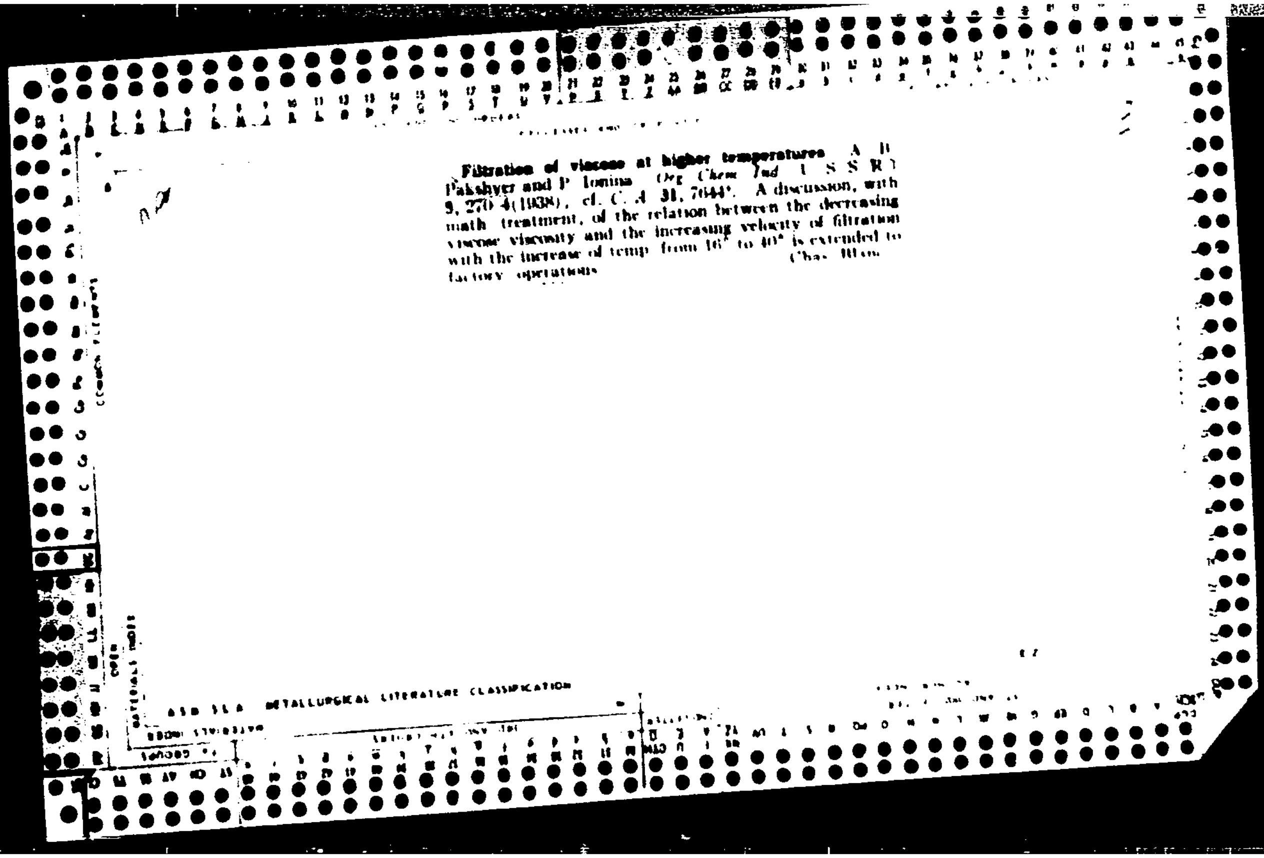
Evaporation of excess ammonia from the cuprammonium spinning solution of cellulose. A. Pakshver, M. Kecharova and B. Mankash. Org. Chem. Ind. (U.S.S.R.) 4, 184-8(1937).—A discussion with math. treatment.

Chas. Blanc

ASB SLA METALLURGICAL LITERATURE CLASSIFICATION

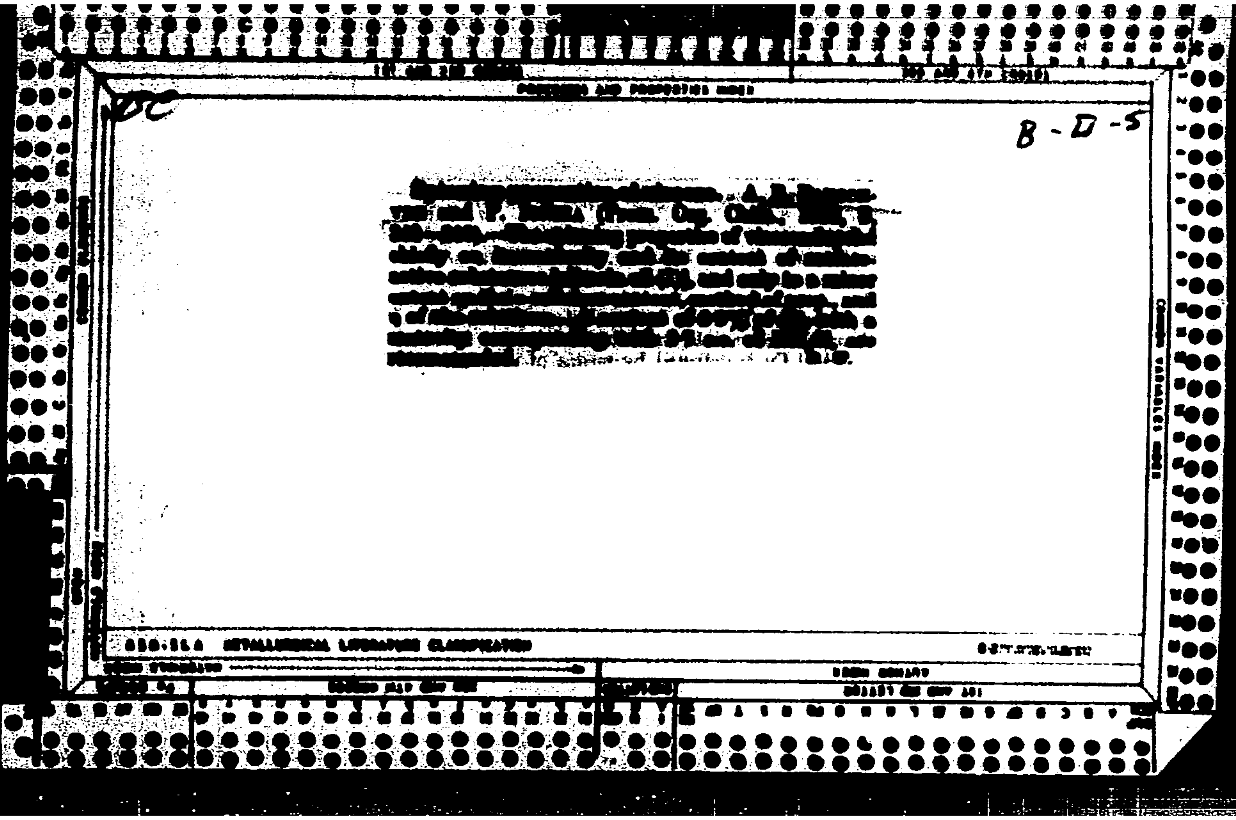


Regeneration of copper and ammonia from the cuprammonium spinning solution of cellulose. A. Pakshver, V. Ponikova and E. Savelova. *Org. Chem. Ind.* (U. S. S. R.) 3, 104-7(1936); cf. C. A. 32, 1920. The scheme consists of filtering off $Cu(OH)_2$ before and after the removal of the NH_3 by vacuum distn. Chas. Blanc



Filtration of viscose at higher temperatures. A. B. Pakshver and P. Ionina. (*Org. Chem. Ind.* U. S. S. R.) 5, 270-4(1938); cf. C. A. 31, 7644⁴. A discussion, with math. treatment, of the relation between the decreasing viscose viscosity and the increasing velocity of filtration with the increase of temp. from 16° to 40° is extended to factory operations. Chas. Blanc

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



PROCESSES AND PROPERTIES INDEX

B-D-5

[illegible]

ASD-SLA METALLURGICAL LITERATURE CLASSIFICATION

23

Evaporation of volatile solvents from solutions of cellulose esters. I. Evaporation in a resting medium. A. Pakshver and E. Mankash. *J. Phys. Chem. U. S. S. R.* 11, 127-33 (1938). The initial rate of evapn. is identical for pure solvents and solns. but the av. rate of evapn. for solns. is less than that for the solvents when EtOH-Et$_2$O mixts. contain more than 2% of cellulose nitrate, or when Me$_2$CO contains more than 4% of cellulose nitrate or more than 10% of cellulose acetate. The retardation of evapn. from solns. is due to formation of a surface film. **II. Evaporation in an air current.** *Ibid.* 134-6. The evapn. is analogous to the cooling process, and is governed by the same empirical formulas. In an air current the evapn. of EtOH + Et$_2$O and of Me$_2$CO is retarded even by small amts. of cellulose esters.

H. C. P. A.

METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

Ca

2

Diffusion of vapors of organic solvents through films of cellulose esters. A. [illegible] and E. [illegible]. J. Phys. Chem. (U. S. S. R.) 11, 400-9(1938).—Diffusion of the vapors of water, EtOH, Et_2O, Me_2CO and CH_2Cl-CH_2Cl through films of acetyl-, nitro- and benzylcellulose was investigated, and equations for calcg. the diffusion coeff. are given. The diffusion coeff. increases with increase in thickness of the film. The diffusion coeff. also varies with time (decreasing) because of the swelling of the film, but a definite relation between the coeff. and swelling was not derived. The solvent has no effect on the diffusion coeff., but the method of prepn. of the film greatly affects the diffusion coeff., which decreases with increase in time and temp. of drying. The degree of swelling is practically unaffected by the solvent but the chem. substances of the film and of the vapors absorbed are important factors. Data are tabulated and plotted.

A. A. Podgorny

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

2

The vapor pressures over the solutions of cellulose ethers. A. Pakshver and E. Manksch. *J. Phys. Chem. (U. S. S. R.)* 11, [illegible]-70(1938).—A new app. for the direct detn. of vapor pressures above volatile liquids, highly viscous liquids and gels with an accuracy of ±10 mm. Hg is described. It consists of a 100-cc. bulb (made out of a pipet) whose ends *a* and *b* are bent. The end *b* is connected by means of rubber tubing to a 5-cc. bulb (made out of a pipet) which in turn is connected to a high glass tube. The end *a* is connected by means of rubber tubing to a high glass rod behind which is placed a mm. scale. This app. can be used also for measurements of the decrease of vapor pressure in the presence of adsorbing substances, for the study of the kinetics of drying and of swelling of gels, and for detg. the total vapor pressures of complex mixts. of volatile substances. Total vapor pressures over mixts. of alc. with ether (from [illegible] to [illegible].4 mol. % of alc.), and with acetone (from [illegible] to [illegible] mol. % of alc.) at 10-40° were investigated. The results obtained did not check well with the empirical formula $p = p_0 x^n$, because *n* did not remain const. for the given mixt., but decreased with increase in the vapor pressure over the mixt. Closest results were obtained with $n = 0.7$. The vapor pressures of solvents over solns. of the ethers of cellulose were also detd. with solvents: 2:3 mixt. of alc. and ether, acetone, and mixt. of alc. and acetone (wt. % 17:83). For concn. of ethers of cellulose up to 70% (acetylcellulose) or up to 60% (nitrocellulose) the vapor pressure of the solvent equals that of the pure solvent. A depression is observed only for solns. that contain less of the solvent than is necessary for the formation of mol. compds. with the ethers of the cellulose. Four references.

W. R. Henn

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

CA

23

The technical development of the production of cuprammonium fibers. A. Pakshver. *Tekh. Byull. GL IV* 1959, No. 3, 3-12; *Khim. Referat. Zhur.* 1960, No. 7, 110 —P. discusses the rationalization of the production of cuprammonium fibers and the regeneration of the components of the spinning solns. of Cu and NH_3. The linters can be steeped by a 3-fold utilization of the steeping alkali. The processes of acidification and washing of lint can be omitted by a suitable selection of the bleaching régime (pH approx. 9). The 2-fold finishing and drying of the fibers are also omitted. NH_3 can be technically absorbed from the spinning solns. by water in columns. Optimum results for regenerating Cu and NH_3 from the spinning water are obtained in vacuum evaporators. The spinning water is also returned to the production cycle.

W. R. Henn

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

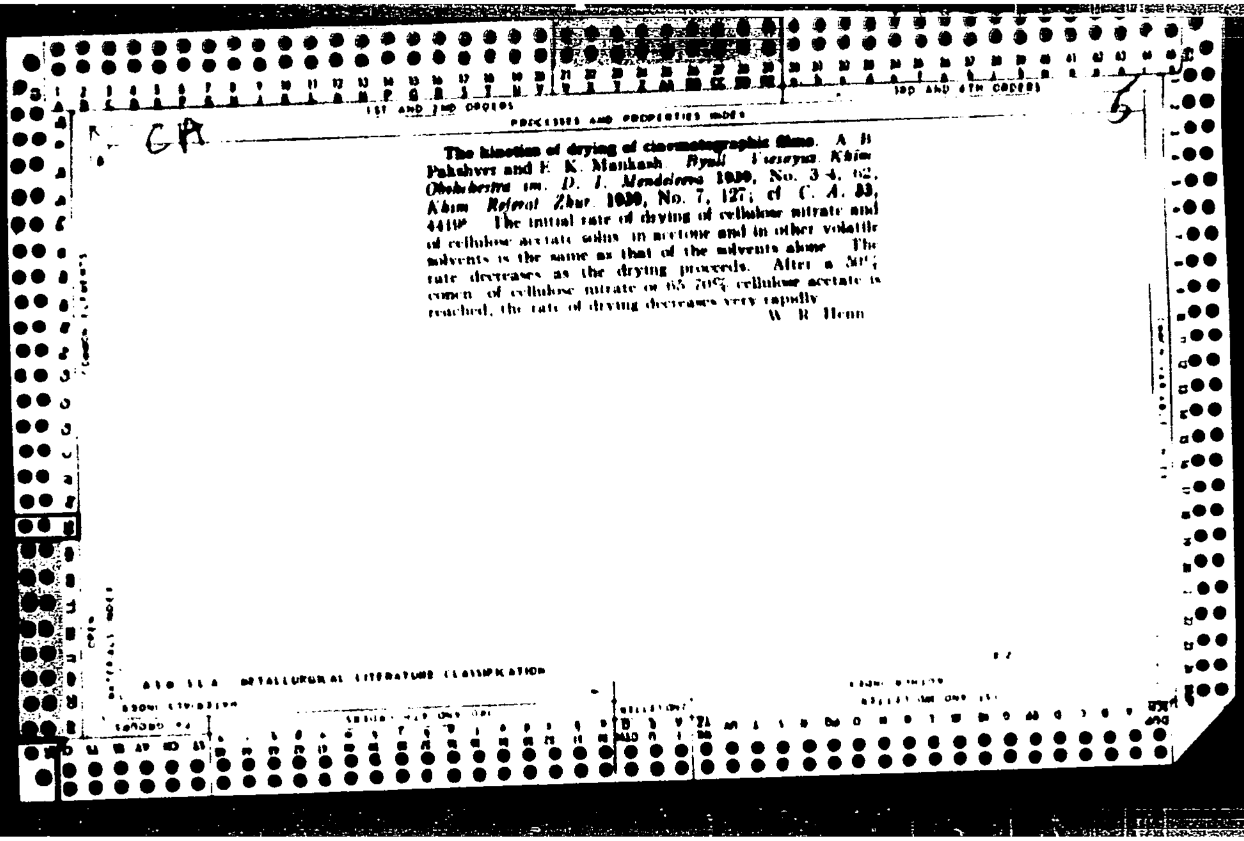
3RD AND 4TH ORDERS

CA

27

Expressed alkali in the production of viscose fibers. A. Pakshver and S. Frolov. *Tekh. Byull. GUIV* 1939, No. 3, 25-33; *Khim. Referat. Zhur.* 1940, No. 7, 109; cf. *C. A.* 35, 4583.—The hemicelluloses contained in the expressed alkali differ in compn. and mol. wt. Various results are obtained in the detn. of hemicelluloses by oxidation with hot $K_2Cr_2O_7$ and H_2SO_4, the results depending on the time of boiling and on the relative proportions of $K_2Cr_2O_7$ and H_2SO_4. The amt. of β-cellulose decreases and that of γ-cellulose increases with time of standing of the expressed alkali. W. R. Henn

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION



1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

GA

5

The kinetics of drying of cinematographic films. A. B. Pakshver and E. K. Mankash. *Byull. Vsesoyuz. Khim. Obshchestva im. D. I. Mendeleeva* **1939**, No. 3-4, 62; *Khim. Referat. Zhur.* **1939**, No. 7, 127; cf. *C. A.* **33**, 4410. The initial rate of drying of cellulose nitrate and of cellulose acetate solns. in acetone and in other volatile solvents is the same as that of the solvents alone. The rate decreases as the drying proceeds. After a 50% concn. of cellulose nitrate or 65-70% cellulose acetate is reached, the rate of drying decreases very rapidly.

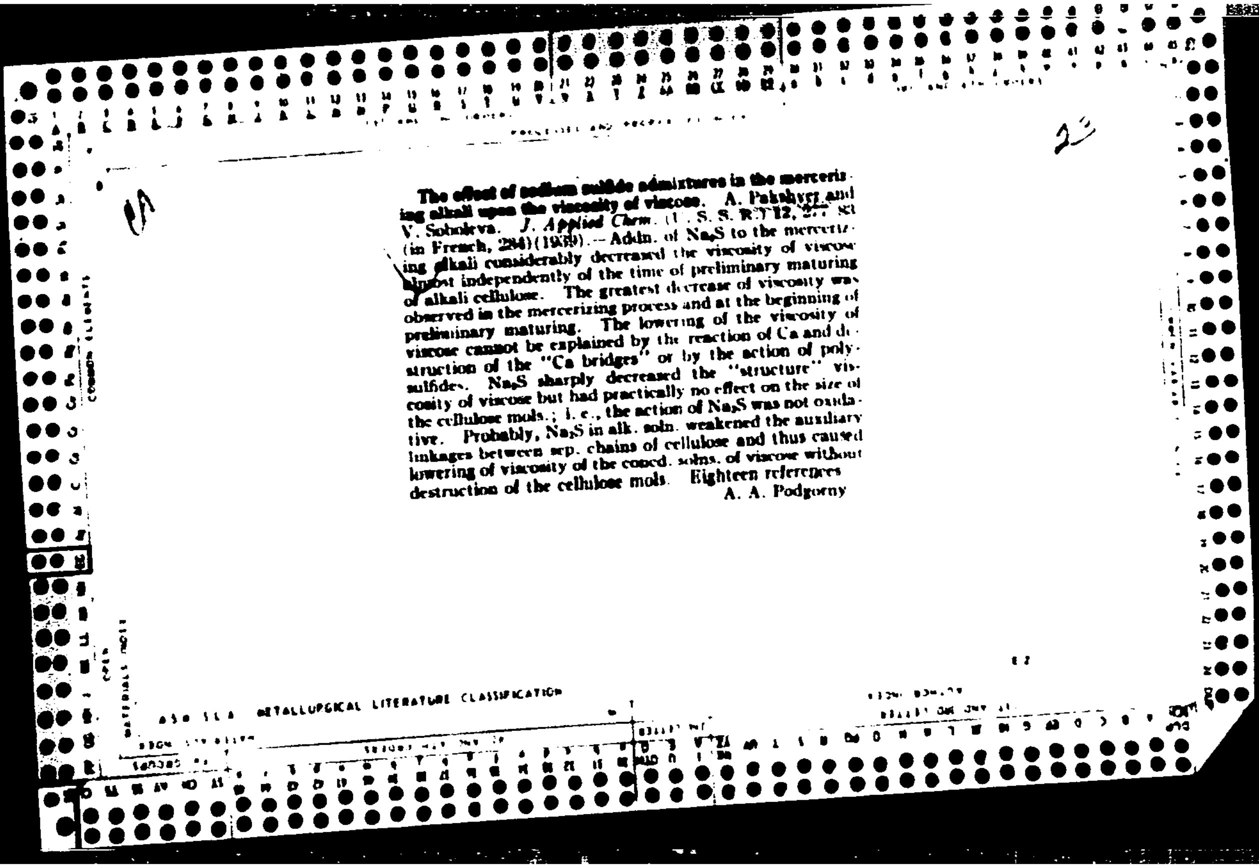
W. R. Henn

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

The function of ammonia in cuprammonium cellulose solution. M. I. Arkhipov and A. B. Pakshver. *Org. Chem. Ind.* (U. S. S. R.) 6, 323-7(1939).—Some addnl. exptl. evidence is presented to show that the viscosity of cuprammonium spinning solns. of cellulose decreases with NH_4OH concn. This effect is more pronounced with stronger cellulose solns. (cf. Pakshver, *et al.*, *C. A.* 31, 7644⁹; 32, 1090¹) Chas. Blanc

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



23

The effect of sodium sulfide admixtures in the mercerizing alkali upon the viscosity of viscose. A. Pakshver and V. Soboleva. *J. Applied Chem.* (U. S. S. R.) 12, 277-84 (in French, 284)(1939).—Addn. of Na_2S to the mercerizing alkali considerably decreased the viscosity of viscose almost independently of the time of preliminary maturing of alkali cellulose. The greatest decrease of viscosity was observed in the mercerizing process and at the beginning of preliminary maturing. The lowering of the viscosity of viscose cannot be explained by the reaction of Ca and destruction of the "Ca bridges" or by the action of polysulfides. Na_2S sharply decreased the "structure" viscosity of viscose but had practically no effect on the size of the cellulose mols.; i. e., the action of Na_2S was not oxidative. Probably, Na_2S in alk. soln. weakened the auxiliary linkages between sep. chains of cellulose and thus caused lowering of viscosity of the concd. solns. of viscose without destruction of the cellulose mols. Eighteen references

A. A. Podgorny

GERASIMOVA, L.S.; PAKSHVER, A.B.

Internal stresses and fatigue limit of cellulose fibers.
Khim. volok. no.4:42-45 '63. (MIRA 16:8)

1. Vsesoyuznyy zaochnyy institut tekstil'noy i legkoy promyshlennosti.

1ST AND 2ND ORDERS

3RD AND 4TH ORDERS

PROCESSES AND PROPERTIES INDEX

Bc

B-I-6

Solubility of basic cupric salts in ammonia, and preparation of cuprammonium solutions of cellulose. M. I. Arkhipov and A. B. Pakshver (J. Appl. Chem. Russ., 1939, 12, [illegible]).—Basic Cu sulphates are less sol. than $CuSO_4$ and more sol. than CuO. The chief factor determining solvent power for cellulose (I) is the concn. of $[Cu(NH_3)_4](OH)_2$ (II). Addition of NaOH promotes dissolution of (I) by raising the effective concn. of (II), as a result of the reaction $[Cu(NH_3)_4]SO_4 + 2NaOH \rightarrow (II) + Na_2SO_4$.

R. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

23

Change in the viscosity of linters on bleaching. A. Pakshver and V. Porotikova. *J. Applied Chem.* (U. S. S. R.) 12, 1892-9(in French, 1899)(1939).—The presence of active Cl in the bleaching bath affects the viscosity of a copper ammonia soln. of linters approx. in direct proportion to the content of active chlorine within the range of 0.5 to 2.5 g./l. The viscosity of bleached cellulose decreases strongly with the degree of bleaching at pH 7.5 to 8.5; at pH 10.5 and above the decrease is not so marked. Indexes characterizing the destruction of the cellulose (copper, iodine no., etc.) change very sharply on bleaching in a neutral medium. A. A. Boehtlingk

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

Changes in cellulose during the production of viscose. A. Pakshver, S. Frolov and A. Pribylov. *Trans. Inst. Chem. Tech. Ivanovo* (U.S.S.R.) 1940, No 3, 158-60.—Ordinary standard sulfite cellulose was treated with 18% NaOH in the cold (1 hr at 20°), and excess alkali washed out. The soly of cellulose (I) was detd by immersing a known wt (approx 1 g) of air-dry I in 40 ml of 10% NaOH at 0° for 45 min, filtering through a No 1 Schott filter, washing the residue on the filter with 10% alkali, warm and cold H_2O until neutral to phenolphthalein, washing with dil. AcOH and with distd H_2O, and drying the residue on the filter at 100-3 to const wt. The moisture content of I was detd by drying at 100-3°. From these data the percentage soly of I in 10% NaOH was detd. I was regenerated from alkali cellulose (after mercerization, cutting and preripening for 24 and 48 hrs) by washing with distd H_2O and weak AcOH. From the xanthate the I was regenerated by treating with NaCl soln., washing the residue with weak H_2SO_4 to complete decompn. of the xanthate and the S removed with hot alc. The regenerated I was washed with water and dried in air. From viscose I was regenerated in the form of films. Thin layers of viscose were placed on glass and treated with satd NaCl and H_2SO_4. The film was freed from acid with water and dried in air. Mercerization of I decreases its soly. in alkalies from 6.13 to 2.08% by removal of the low-mol. fractions. The soly increases to 2.82% after cutting, to 5.25% after preripening for 24 hrs., to 11.48% after preripening for 48 hrs., to 12.85% after xanthation and to 23.08% after diln. The breaking up of the I structure during soln. is connected with the solvation of the single micelles and I particles in soln and has a greater effect on the soly. of I in an alk soln than the preceding processes of destruction of I during mercerization, cutting and preripening. The results agree well with the unpublished results of F. M. Les on changes in the soly of viscose silk from 25% for the freshly spun fibers to 18-20% for the finished and air-dried fiber and to 10-15% for the fiber dried in driers at 70-80°.

W. R. Henn

A S M - S L A METALLURGICAL LITERATURE CLASSIFICATION

BELKIN, A.; BORISOV, A.; GENIN, B.; GUSLITSER, I.; GRUZDEV, V.; DICH,S.;
DUSEYEVA, Ye.; YEGOROVA, A.; ZAK, S.; KAZYMOV, A.; KRUPENNIKOVA,Ye.;
KONKIN, A.; MOGILEVSKIY, Ye.; PAKSHVER, A.; SMELKOV, G.;
CHICHKHIANI, A.; CHUGUNOV, K.; SHIFRIN, L.; YUNOVICH, E.

Sergei Alekseevich Tairov. Khim.volok. no.3:79 '62.
(MIRA 16:2)
(Tairov, Sergei Alekseevich)

PAKSHVER, A.

a

The production of simple cellulose ethers in a homogeneous medium. A. Pakshver, S. Frolov and Z. Malysheva. *Trans. Inst. Chem. Tech. Ivanovo* (U. S. S. R.) 1940, No. 3, 161-4.—The paper is a preliminary report of alkylating cellulose under conditions similar to those existing in a homogeneous medium and to those described by L. Bock (*C. A.* 31, 8182^3). Viscose silk, bleached linter (of the Shulskaya cuprammonium plant) and filter paper were treated with 12 and 18% NaOH. The amt. of added ZnO was 5% of the wt. of the solid base. The expts. were carried out at 5-20° with a 5% concn. of cellulose. At 0° (and lower) viscose silk dissolves rapidly in the base contg. ZnO and forms a yellowish, semitransparent dense mass. Bleached linters form a gel-like mass which contains lumps and fibers. Filter paper apparently dissolves but an examination under the microscope shows only greatly swollen fibers. At room temp. and lower the solns. of the incompletely dissolved products are very stable. By heating to 60-70° (and sometimes to 50°) flakes are formed which dissolve on cooling. Higher concns. of base produce no flakes in spite of the fact that viscose silk dissolves directly in the concd. base. For methylation an excess of Me_2SO_4 (5-10 mols.) was added in small portions with mixing to the cellulose soln. The reaction began at room temp. and proceeded with foaming and a temp. rise of 45-50°. After the reaction the basic medium was neutralized and poured into H_2O at 80°. Methylcellulose sepd. in the form of flakes which were washed with hot H_2O and dried. The flakes dissolved completely in cold H_2O; in hot H_2O they sepd. in the form of a gel and flakes. The viscose cellulose fibers were sol. in cold H_2O and in a no. of org. solvents. The methylated mass from filter paper is completely sol. in H_2O and contained approx. 14% of MeO. The temp. régimé and the time were not accurately detd. (the time of the reaction was 2-3 hrs.) Benzylation produced substances (m. 161°) sol. in alc.-benzene and pyridine and partly sol. in benzene. In benzylation expts. viscose silk was dissolved in 8% NaOH with addn. of ZnO. The reaction was carried out at room temp. and was completed by heating 1.5 hrs. on a water bath. The exact conditions of the expts. were not recorded and the properties of the products were not detd. The described method is suitable for the production of simple cellulose esters sol. in H_2O, since products of small degrees of alkylation (but sol. in H_2O) can be obtained. 13 references.

W. R. Henn

PROCESSES AND PROPERTIES INDEX

2

The effect of various methods of treatment on the viscosity of nitrocellulose A. Pakshver, S. Frolov and L. Lebedeva. *Trans. Inst. Chem. Tech. Ivanovo* (U. S. S. R.) **1940**, No. 3, 165-7.—The starting nitrocellulose (I) contained 11.1% of N. Its η was detd. simultaneously in 0.2, 1.0 and 5.0% acetone solns. The η of the 0.2% soln. characterizes more fully the size of the I mols., and the η of the 5% soln. characterizes the properties of commercial solns. used for the production of nitro lacquers and of motion-picture films. The η of the 5% soln. was detd. at 20° with a 25-ml. standard bulb which is used for measuring the η of cuprammonium solns. of cellulose. The η of 0.2% and 1.0% solns. was detd. in an Ostwald viscometer at 20°. I was (1) boiled for 3 hrs. in 150 parts of distd. water; (2) boiled under the same conditions for 8 hrs.; (3) boiled for 3 hrs. in water contg. some $Ca(OH)_2$; (4) boiled under the same conditions for 8 hrs.; (5) treated for 2 hrs. with 100 parts of a soln. of Na hexametaphosphate (II) in concns. of 10 g./l. at 50°; (6) the same as in 5, but the initial I was preliminarily treated with boiling hard water for 3 hrs.; (7) the same as in 5, but the initial I was treated as in 4; (8) boiled for 3 hrs. with 0.2% soda soln.; (9) boiled for 8 hrs. with 0.2% soda soln. In all cases I was washed with cold water after the treatment, dried in open air and at 50° in a drier. For the detn. of η I was shaken in a mixer. In the last 2 cases the treatment was accompanied by a yellow color of the soln. and of the I. Boiling I with distd. water is accompanied by a decrease of the η of the 5% soln. (by 10% on boiling for 3 hrs. and by 33% on boiling for 8 hrs.), while the η of the 0.2% soln. and the percentage of N in I remained practically unchanged (11.0 and 11.1%). This shows that the size of the I particles and the degree of esterification remained unchanged. Boiling I in hard water increases considerably the η of the soln. (even of the 0.2% solns.). For the 5% solns. the increase of the η was 50% after boiling 3 hrs. and 55% after boiling 8 hrs. Treatment of I with II not only "removes" the excess η acquired by I by boiling it with hard water, but decreases the η below that of the initial I, probably at the expense of the removal of Ca from the ash of the initial product. Treatment of I with soda leads to a sharp decrease of the η and to the emulsification of the nitro group. The expts. showed that the treatment with II is of practical importance, not only for lowering the η of the I, but also for replacing the expensive softened water with hard water during the washing and stabilization of I. W. R. Henn

METALLURGICAL LITERATURE CLASSIFICATION

The utilization of expressed alkali in the production of viscose fibers. A. Pakshver and S. Frolov. *Trans. Inst. Chem. Tech. Ivanovo* (U. S. S. R.) **1940**, No. 3, 168-72. Alkali recovered by expression in the treatment of cellulose contains much hemicellulose. Viscose prepd. by use of this alkali is more viscous and more difficult to filter, than that prepd. with pure alkali. Expressed alkali had no effect on the ripening of viscose. Nine references. W. R. Henn

ASO-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

4

25

The dyeing properties and methods for distinguishing viscose and cuprammonium fibers. A. Pakshver and S. Frolov. *Trans. Inst. Chem. Tech. Ivanovo* (U. S. S. R.) 1940, No. 3, 173-7.—The principal differences in the dyeing of viscose and cuprammonium fibers are caused by their different structures and especially by the presence of the surface layer on viscose fiber. The following colors were produced by the different mixts. on cuprammonium and viscose fibers, resp.: Rhodamine B Extra + Anil Pure Light Blue FF produces pure blue and red-violet colors; Rhodamine B Extra + Anil Straight Green Zh produces green and pink to red; Rhodamine B Extra + Sirius Blue GG produces pure blue and pink to red-violet; Rhodamine B Extra + Viscose Blue NRF produces pure blue and pink; Rhodamine B Extra + Viscose Sea Blue NB produces blue and red-violet; Rhodamine B Extra + chrysophenine produces yellow-orange and red; Rhodamine B Extra + Icyl Brown GS produces beige and red-violet; safranine + Anil Straight Green Zh produces green and red-brown; Methylene Light Blue + Diamine Pink produces red-violet and blue; Methylene Light Blue + Anil Orange produces gray and blue; auramine + Anil Pure Light Blue produces blue-green and yellow-greenish. The colors are obtained by mixing equal parts of the dissolved dyes in concns. of 0.5-1.0 g./l. for the basic and 1-3 g./l. for the substantive dyes. The samples are washed with cold water. Nine references. W. R. Henn

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

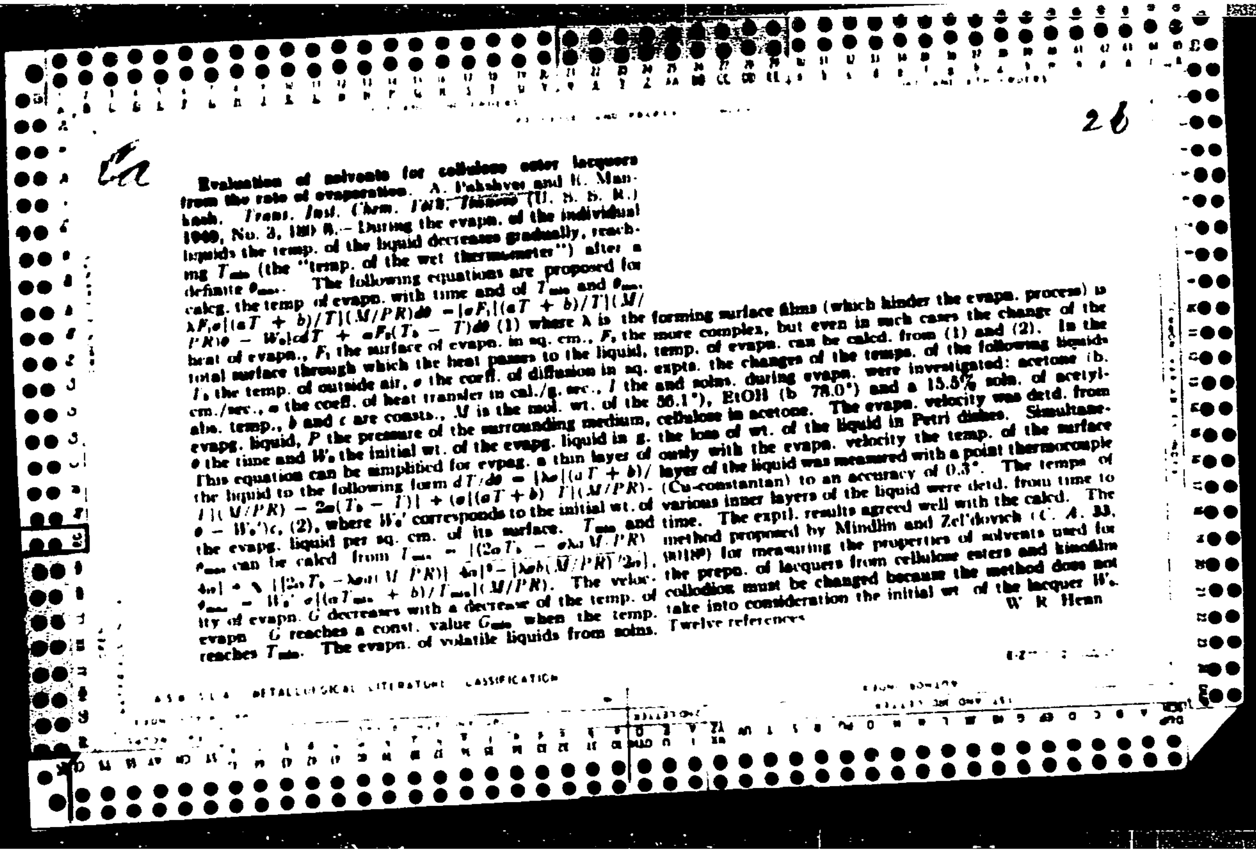
1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

23

The effect of salts of heavy metals on the velocity of decomposition of cellulose xanthate. A. Pakshver, S. Frolov and N. Karegina. *Trans. Inst. Chem. Tech. Ivanovo* (U. S. S. R.) **1940**, No. 3, 178-80. The object of the expts. was to amplify the results obtained by Danilov and Gintse (C. A. **33**, 5179) and to verify the decompn. velocity of Na, Ca, Zn, Ni and Cu cellulose xanthates. A 1-mm. layer of ordinary viscose was placed on a glass plate, coagulated in concd. NaCl soln. for 20 min., washed on the glass with concd. NaCl soln. to complete removal of impurities (sulfides, thiocarbonates, etc.) and treated for 10 min. with a concd. soln. of the corresponding salt ($CaCl_2$, NaCl, $CuCl_2$, $ZnCl_2$). Preliminary expts. showed that a 10-min. reaction is sufficient. The film was decompd. with N H_2SO_4 for a definite time (with a stop watch) and immediately immersed in a 10% NaOAc soln., after which it was immersed for 5 min. in 20 ml. of AcOH and 10 ml. of 0.1 N I soln. The amt. of AcOH and the time of the reaction were detd. by a blank expt. The excess I was titrated with thiosulfate and the percentage of xanthate decompd. calcd. The velocity of the decompn. of xanthate does not increase with aging of the viscose, but decreases slightly. A decrease takes place also with the increase of the ratio α-cellulose NaOH in viscose. The decompn. velocity is detd. by the colloidal properties of the film of the cellulose. The older xanthates form on decompn. with acid a denser surface film of the regenerated cellulose, which retards the decompn. This explains also the effect of the compn. of viscose on the decompn. velocity of the xanthate. $NiSO_4$ retards the decompn. of the xanthate to a smaller extent than does $ZnSO_4$. Therefore $ZnSO_4$ cannot replace $NiSO_4$ in the pptg. bath. W. R. H.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Ca

2b

Evaluation of solvents for cellulose ester lacquers from the rate of evaporation. A. Pakshver and R. Mankash. *Trans. Inst. Chem. ~~Tech. Ivanovo~~* (U. S. S. R.) 1940, No. 3, 180 8.—During the evapn. of the individual liquids the temp. of the liquid decreases gradually, reaching T_{min} (the "temp. of the wet thermometer") after a definite θ_{min}. The following equations are proposed for calcg. the temp of evapn. with time and of T_{min} and θ_{min}. $\lambda F_1\sigma[(aT + b)/T](M/PR)d\theta = -[\sigma F_1[(aT + b)/T](M/PR)\theta - W_0]cdT + \alpha F_2(T_0 - T)d\theta$ (1) where λ is the heat of evapn., F_1 the surface of evapn. in sq. cm., F_2 the total surface through which the heat passes to the liquid, T_0 the temp. of outside air, σ the coeff. of diffusion in sq. cm./sec., α the coeff. of heat transfer in cal./g. sec., T the abs. temp., a, b and c are consts., M is the mol. wt. of the evapg. liquid, P the pressure of the surrounding medium, θ the time and W_0 the initial wt. of the evapg. liquid in g. This equation can be simplified for evpag. a thin layer of the liquid to the following form $dT/d\theta = [\lambda\sigma[(aT + b)/T](M/PR) - 2\alpha(T_0 - T)] + (\sigma[(aT + b)/T](M/PR)\theta - W_0')c$, (2), where W_0' corresponds to the initial wt. of the evapg. liquid per sq. cm. of its surface. T_{min} and θ_{min} can be calcd from $T_{min} = [(2\alpha T_0 - \sigma\lambda aM/PR)/4\alpha] + \sqrt{[(2\alpha T_0 - \lambda\sigma aM/PR)/4\alpha]^2 - [\lambda\sigma b(M/PR)/2\alpha]}$, $\theta_{min} = W_0'/\sigma[(aT_{min} + b)/T_{min}](M/PR)$. The velocity of evapn. G decreases with a decrease of the temp. of evapn. G reaches a const. value G_{min} when the temp. reaches T_{min}. The evapn. of volatile liquids from solns. forming surface films (which hinder the evapn. process) is more complex, but even in such cases the change of the temp. of evapn. can be calcd. from (1) and (2). In the expts. the changes of the temps. of the following liquids and solns. during evapn. were investigated: acetone (b. 56.1°), EtOH (b 78.0°) and a 15.5% soln. of acetylcellulose in acetone. The evapn. velocity was detd. from the loss of wt. of the liquid in Petri dishes. Simultaneously with the evapn. velocity the temp. of the surface layer of the liquid was measured with a point thermocouple (Cu-constantan) to an accuracy of 0.3°. The temps of various inner layers of the liquid were detd. from time to time. The exptl. results agreed well with the calcd. The method proposed by Mindlin and Zel'dovich (*C. A.* 33, 9119) for measuring the properties of solvents used for the prepn. of lacquers from cellulose esters and kinofilm collodion must be changed because the method does not take into consideration the initial wt. of the lacquer W_0. Twelve references

W R Henn

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PROCESSES AND PROPERTIES INDEX

Ca

2

Determination of the viscosity of alkaline solutions of viscose rayon. A. Pakshver, S. Frolov and E. Pokrovskaya. *Trans. Inst. Chem. Tech. Ivanovo* (U. S. S. R.) 1940, No. 3, 189-91.—Dissolve a sample of air-dry viscose rayon (with a known moisture content) with mixing in a glass contg. 8% NaOH and keep it in a cooling mixt. at 5°. After soln. remove the glass from the cooling mixt., let the temp. rise to 20°, pour the soln. into a bulb used for the detn. of η of cuprammonium cellulose soln., keep it in a thermostat at 20° and det. the η of cellulose (I). One percent solns. of I in a base can stand without the sepn. of I from the soln. for 10-14 hrs., after which a turbidity and white flakes appear. Standing of the soln. in open air and air blowing through the soln. do not change the η of the basic soln. I dissolves somewhat more rapidly in an 8% soln. of NaOH contg. 1% of ZnO, and the sepn. of I takes place after a longer period of time. The relative η of the I soln. in an 8% base is less than that in a similar base contg. 1% of ZnO. The basic solns. of I are considerably more stable than are the cuprammonium solns. and they can be used in some cases (in investigating the properties of viscose silk and staple fiber) for measuring the η.

W. R. Henn

METALLURGICAL LITERATURE CLASSIFICATION

PAKSHVER, A.

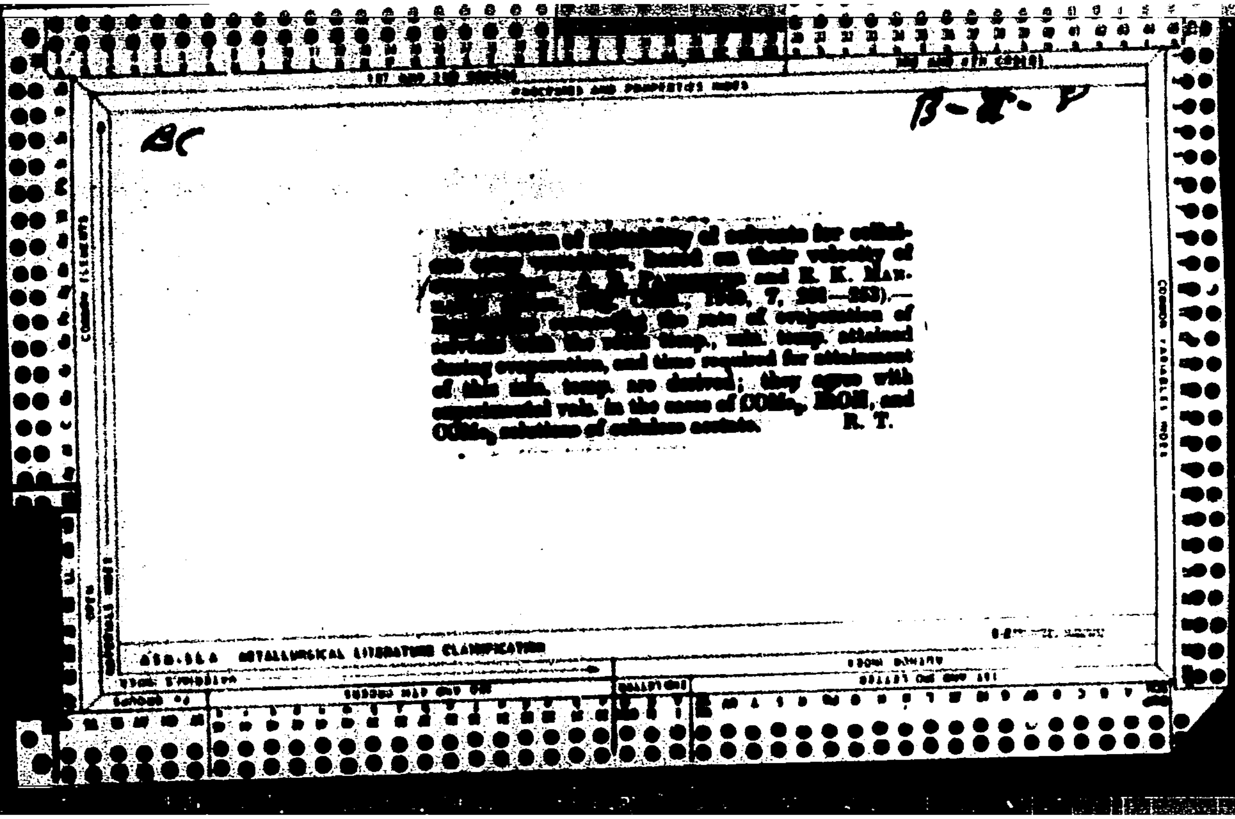
Symposium on synthetic fibers in the German Democratic Republic.
Khim. volok. no.4:76-77 '65. (MIRA 18:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskikh volokon, g. Kalinin.

PAKSHVER, A.

All-Union Conference on the Main Problems of the Physics and Chemistry of Cellulose. Khim.volok no.4:76-79 '59. (MIRA 13:2)

(Cellulose - Congresses)



PROCESSES AND PROPERTIES INDEX

BC

B-II-P

[illegible] of volatility of solvents for cellu-[illegible], based on their velocity of [illegible] and R. K. Mar-[illegible] (19[illegible], 7, [illegible]).—[illegible] the rate of evaporation of solvent with the wick temp., min. temp. attained during evaporation, and time required for attainment of this min. temp. are derived; they agree with experimental vals. in the cases of $COMe_2$, EtOH, and $COMe_2$ solutions of cellulose acetate. R. T.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

CA

23

Finishing cuprammonium rayon. A. B. Pakshver and M. I. Arkhipov. Russ. 59,1, Feb. 28, 1941. The quality of the fiber is improved and the consumption of chemical reagents in the regeneration of the Cu soln. is decreased by treating the freshly prepd. fibers with a soln of $(NH_4)_2SO_4$ contg. NH_4OH

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

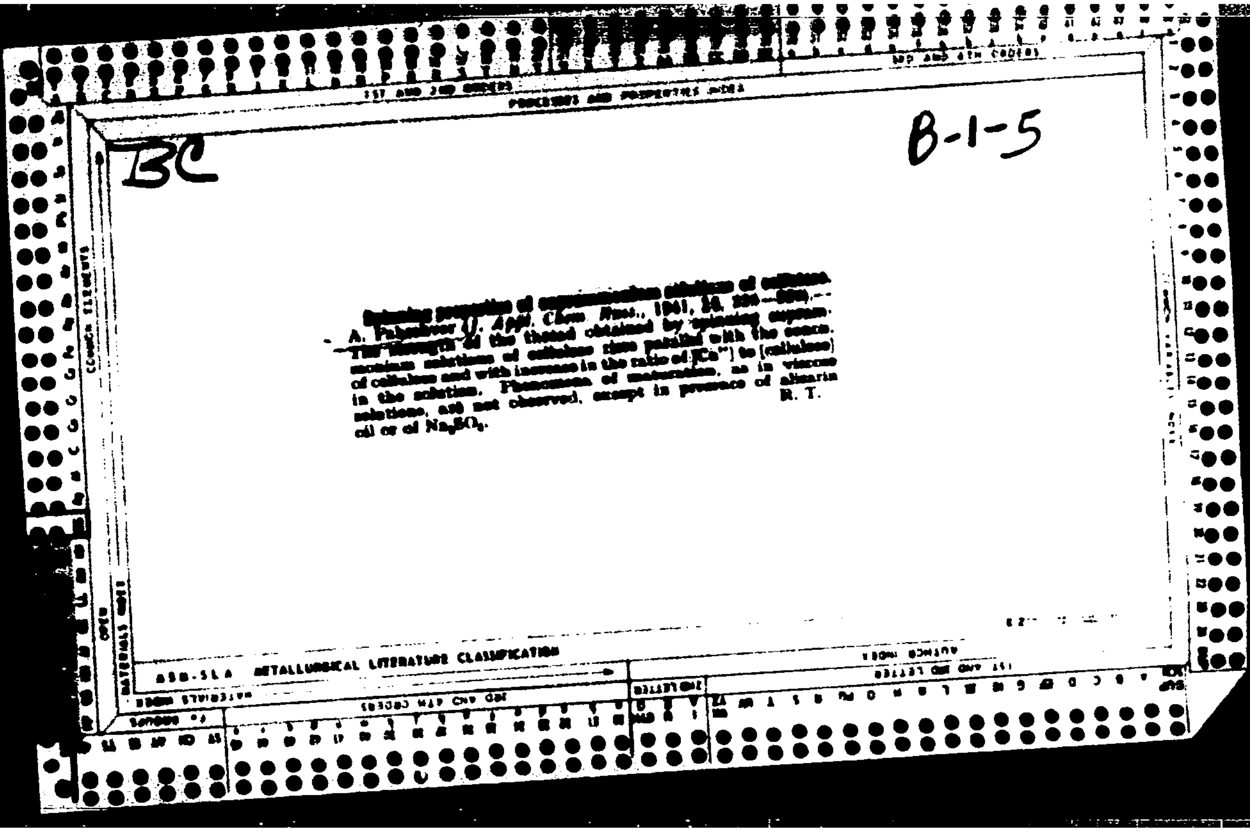
PROCESSES AND PROPERTIES INDEX

CA

23

Decomposition of the copper-cellulose complex by water. A. Pakshver and Yu. Shtormin. *J. Applied Chem.* (U. S. S. R.) 14, 223-5(1941). The cuprammonium-cellulose soln. was deposited in a thin layer on a glass plate and this was immersed in running water for a definite period, then in dil. H_2SO_4 until decompn. of the complex was complete. The soln. was analyzed for Cu, and the deposited cellulose (after drying to const. wt.) was detd. as hydrocellulose. The time of treatment was varied from 3 to 15 min., temp from 20° to 40°, NH_3 concn. from 2.05 to 0.49 g./l. and the cellulose concn. in the cuprammonium soln. from 3.01 to 6.45%. In all cases the amt. of Cu split off by H_2O immersion approached 0.5 Cu atom per glucose unit. the elevation of temp. causes a slight increase of the reaction rate; increase of NH_3 concn. in the H_2O up to 2 g./l. shows no appreciable effect on the rate. By increase of the cellulose concn. in soln. with const. initial Cu-cellulose ratio the rate of decompn. (hydrolysis) is decreased, probably owing to retardation of diffusion into the film. Increase of Cu-cellulose ratio with constant cellulose concn. in soln. decreases the rate of hydrolysis, probably because of displacement of equil. to the left: $(C_6Cu_{0.5})_2Cu + 4NH_3 + H_2O \rightleftarrows 2(C_6Cu_{0.5}) + Cu(NH_3)_4(OH)_2$. It is concluded that Cu is joined to cellulose by a double bond: one Cu atom per 2 glucose residues is joined less firmly and is split off by treatment with H_2O by hydrolysis, whereas the second part of the Cu (the amt depending on the degree of "coppering" of the cellulose) is split only by acid treatment. G. M. Kosolapoff

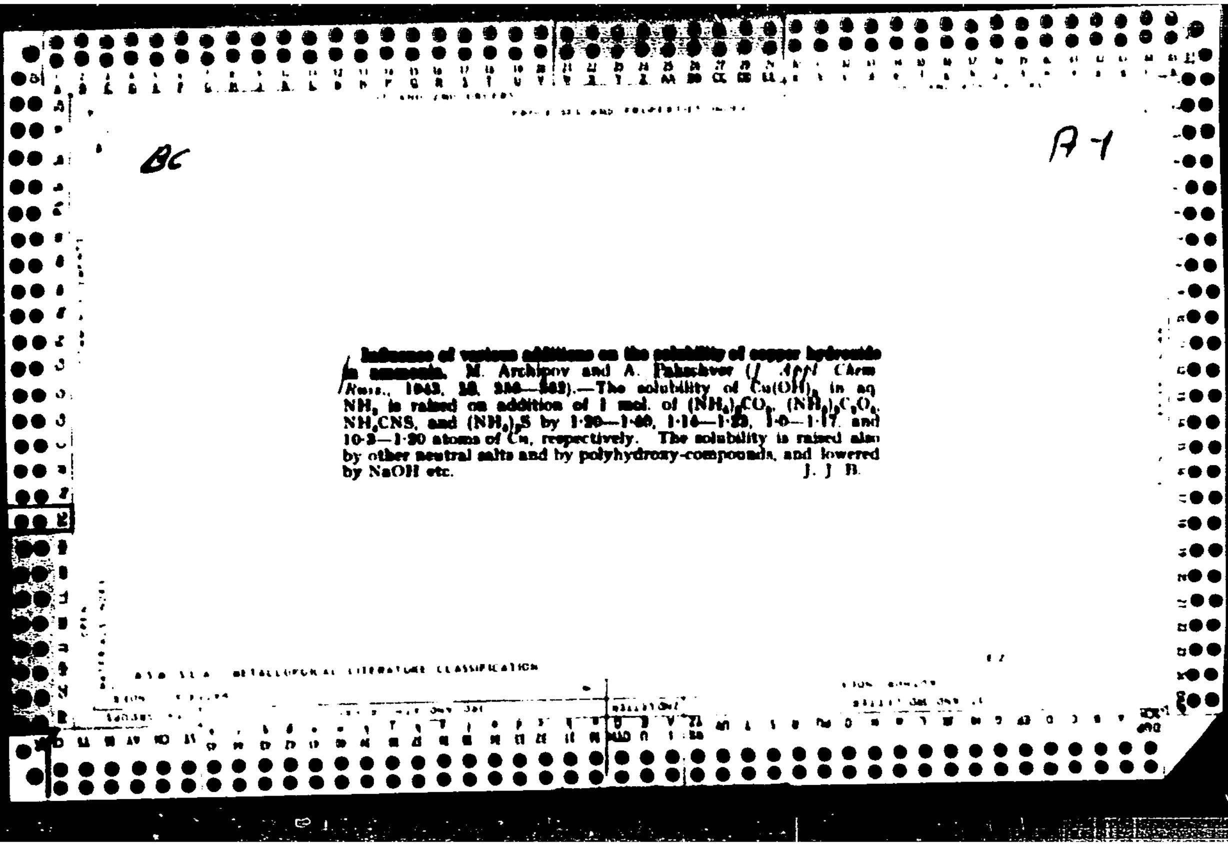
ASA-SLA METALLURGICAL LITERATURE CLASSIFICATION



BC

B-1-5

Spinning properties of cuprammonium solutions of cellulose. A. Pakshver (J. Appl. Chem. Russ., 1941, 14, [illegible]).—The strength of the thread obtained by spinning cuprammonium solutions of cellulose rises parallel with the concn. of cellulose and with increase in the ratio of [Cu''] to [cellulose] in the solution. Phenomena of maturation, as in viscose solutions, are not observed, except in presence of alizarin oil or of Na_2SO_3. R. T.



Bc

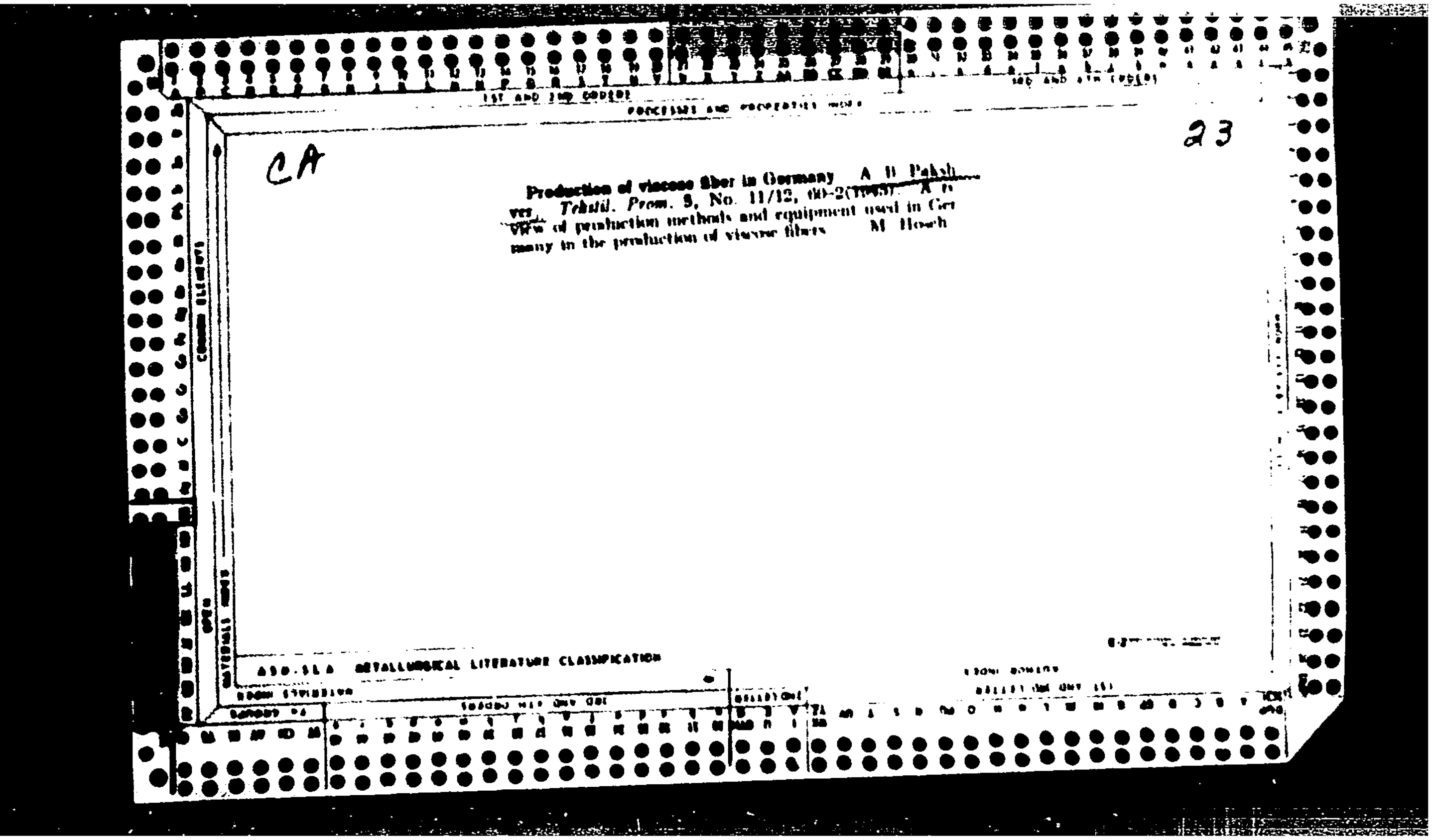
A-1

Influence of various additions on the solubility of copper hydroxide in ammonia. M. Archipov and A. Pakschver (*J. Appl. Chem. Russ.*, 1943, 16, [illegible]).—The solubility of $Cu(OH)_2$ in aq NH_3 is raised on addition of 1 mol. of $(NH_4)_2CO_3$, $(NH_4)_2C_2O_4$, NH_4CNS, and $(NH_4)_2S$ by 1·20—1·60, 1·16—1·25, 1·0—1·17, and 10·3—1·20 atoms of Cu, respectively. The solubility is raised also by other neutral salts and by polyhydroxy-compounds, and lowered by NaOH etc. J. J. B.

Br. Ab.

9/8 Reactions

Oxidation of ammonia in solutions of cuprammonium compounds. A. Pakschver and A. Zlatoustovskaja (*J. Appl. Chem. Russ.*, 1944, 17, 258–265).—In presence of colloidal $Cu(OH)_2$, ammoniacal solutions of $Cu(OH)_2$ are oxidised to HNO_2 by air. The reaction is promoted by alkalis and hindred by dissolved cellulose. E. A. B.

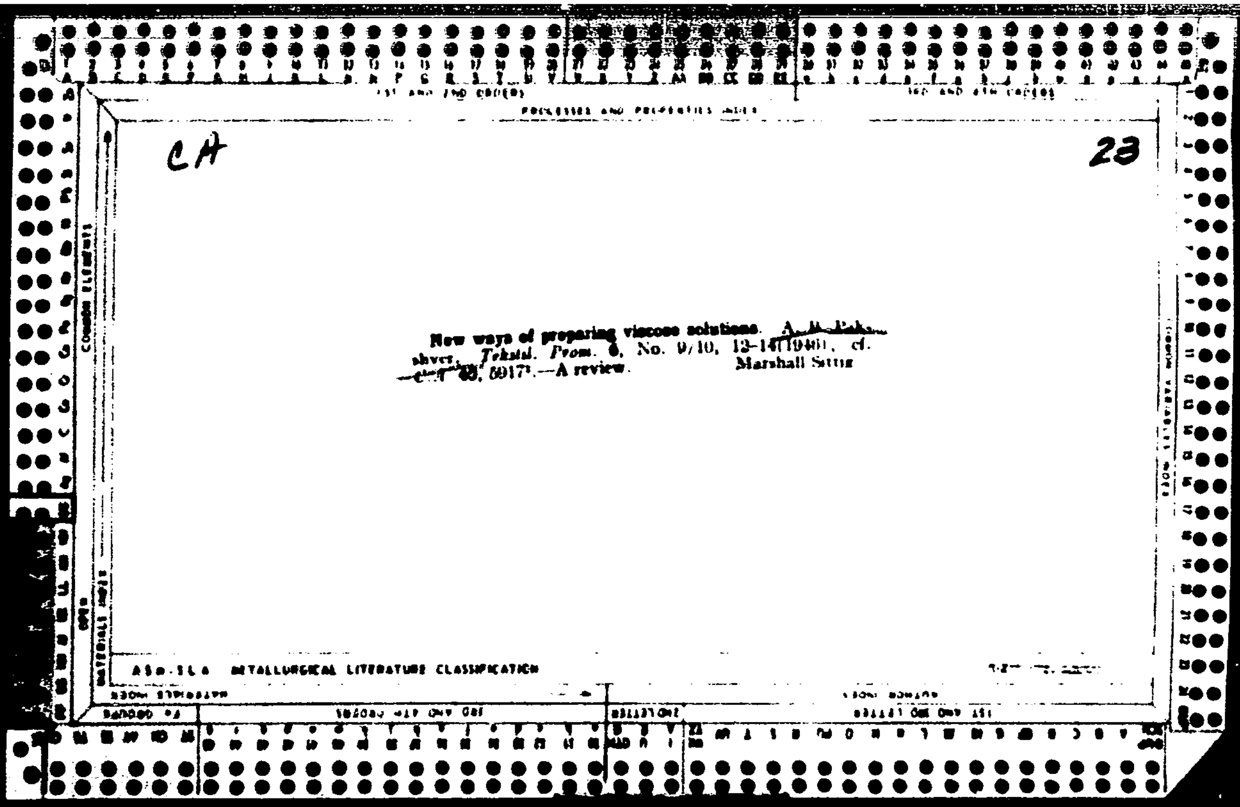


CA

23

Production of viscose fiber in Germany. A. B. Pakshver. *Tekstil. Prom.* 5, No. 11/12, 60-2(1945).—A review of production methods and equipment used in Germany in the production of viscose fibers. M. Hosch

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



1ST AND 2ND ORDERS

PROCESSES AND PROPERTIES INDEX

3RD AND 4TH ORDERS

CA

23

New ways of preparing viscose solutions. A. B. Pakshver. *Tekstil. Prom.* **6**, No. 9/10, 13-14(1946); cf. C.A. **40**, 6017^3.—A review.

Marshall Sittig

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PAKSHVER, A. B.

22513 Pakshver, A. B. Polucheniye I Svoistva Poliamidnykh Smol.
Vysokomolyekulyar. Soyedineniya, Vyp. 9, 1949, S. 58-70
Bibliogr: S. 69-70

SO: Letopis' No 30, 1949

CA

25

Hygroscopicity and elongation (in water) of viscose and cuproammonium silk fibers. A. B. Pakshver, S. S. Frolov, and N. N. Filatova. *Tekstil. Prom.* 10, No. 12, 18-20 (1950). Certain properties of viscose and cuproammonium rayon are detd. by the mol. structure of their fibers which is conditioned by spinning, drying, etc. Hygroscopicity and elongation data of these fibers treated with aq. solns. of NaOH at 20° are discussed. Elisabeth Barabash

PAKSHVER, A. B.

USSR/Chemistry - Synthetic fibers, Analysis Sep 50

"Potentiometric Determination of Sulfates in the Precipitating Bath of the Viscose Silk Manufacturing Process," S. G. Zelikman, S. P. Makar'yeva, A. B. Pakshver, All-Union Sci Res Inst of Synthetic Fiber

"Zavod Lab" Vol XVI, No 9, pp 1053-1057

Develops method for potentiometric titration of precipitating baths with Ba chloride in presence of H peroxide. Demonstrates possibility of potentiometric titration of precipitating baths with Pb nitrate with ferroferricyanide electrode as indicator. Recommends 2d method as more efficient.

[redacted] PA 169T20

CA

Reaction of cellulose with ammoniacal and alkaline solutions of metallic hydroxides. A. Pakshver, M. Arkhipov, and B. Geller (Ivanovo Inst. Chem. Technol.). (*J. Applied Chem. U.S.S.R.* 23, 187-97(1950)(Engl. translation); *Zhur. Priklad. Khim.* 23, 181-91(1950).—Cellulose (I) absorbs metallic hydroxides (II) from alk. or ammoniacal solns (best from alk. solns.); in alk. soln. the absorption increases in the order $Zn(OH)_2$ (III) < $Cu(OH)_2$ (IV); in NH_3 soln., the order is III < $Ni(OH)_2$ (V) < IV; the soly. of I in ammoniacal II soln. increases in the series III < $Co(OH)_2$ (VI) < V < IV; IV and VI decrease the soly. of I in NaOH, although IV is strongly absorbed from the soln.; $CO(NH_2)_2$ and C_5H_5N do not affect the soly. of I in caustic alkalies but they increase it in alk. or ammoniacal solns. of II. The increase of soly. of I in alk. or ammoniacal solns. of II is due to formation of unstable coordination compds. of $CO(NH_2)_2$ and C_5H_5N with II. Quant. I soly. data and data on absorption of II from soln. by I are given. Co was detd. by a new method as follows: 20 ml. 10% NaOH and 20 ml 30% H_2O_2 are added to a soln. of Co II salt in a tall beaker. After the $Co(OH)_3$ has settled, the mixt. is boiled 15 min., cooled, and 25 g. KI and 25 g. H_2SO_4 are added and, after a few min., the iodine liberated is titrated with $Na_2S_2O_3$ as usual. E. U. Elam

CA

23

Solubility of cellulose in ten % solution of alkali. A. B. Pakshver and S. S. Frolov (Lab. Artificial Fibers, Ivanovo Chem.-Tech. Inst.). *Zhur. Priklad. Khim.* 23, 830-8 (1950); *J. Applied Chem. U.S.S.R.* 23, 885-91 (1950) (English translation).—Viscose rayon fibers (1 g.), not characterized as to history or specifications, were stirred constantly for 45 min. with 40 ml. 10% NaOH at 20°, after various pretreatments. Soly. was greatest (45%) for wet, undried fibers. Fibers dried at 20, 60, and 110° without stretching were 34, 34, and 30% sol., resp. Fibers dried at 25 and 75% of the av. breaking load (temp. not given) were 19 and 11% sol., resp. Similar data are also given for cuprammonium fiber. Some data are given for treatment times greater than 45 min. J. P. Danehy

10

CA

Solubility of hydroxides of copper, zinc, nickel, and cobalt in sodium hydroxide and in ammonia. M. I. Arkhipov, A. B. Pakshver, and N. I. Podkorytova (Ivanov Chem. Technol. Inst.). *Zhur. Priklad. Khim.* (J. Applied Chem.) 23, 680-6(1950); cf. *ibid.* 23, 181(1950).—Soly. was detd. at 20° after 24-hr. contact between the hydroxide and the soln. Selected data of equil. concns. of the hydroxide (g./l.) in terms of the concn. of NH_3 or NaOH (g./l.) are: in NH_3 40.7, 130.5-130.0, 213.0, $Zn(OH)_2$ 10.6, 19.3 (max.), 18.7; NH_3 26.4, 126.0, 198.0, $Ni(OH)_2$ 2.26, 9.0, 14.5; NH_3 43.9, 129.7, 204.0, $Cu(OH)_2$ 3.75, 11.9, 15.5; in NaOH 68.4, 203.0, 260.0, $Zn(OH)_2$ 8.0, 45.5, 80.4; NaOH 68.4, 202.0, 260.0, $Cu(OH)_2$ 0.25, 2.97, 10.4; at 15°, NaOH 58.4, 172.8, 240.0, $Co(OH)_2$ 0.10, 0.80, 2.61; at 15°, NaOH 88.4, 169.2, 209.2, $Co(OH)_2$ 0.57, 4.00, 9.28. The order of decreasing soly. in NH_4OH is $Zn(OH)_2 > Cu(OH)_2 > Ni(OH)_2$; in NaOH, it is $Zn(OH)_2 > Co(OH)_2 > Cu(OH)_2 > Ni(OH)_2$. The stability of the solns. was tested by dilg. the satd. solns. with H_2O until beginning pptn. at 18-20°, allowing to rest 48 hrs. in the dark, and analyzing the supernatant soln. From the exptl. data, the order of decreasing stability toward hydrolysis is, in solns. in NH_4OH, $Zn(OH)_2 > Cu(OH)_2 > Ni(OH)_2$, and in soln. in NaOH, $Zn(OH)_2 > Cu(OH)_2$. Solns. of the same hydroxide in NH_4OH are more stable than in NaOH. Whereas $Zn(OH)_2$ is more sol. in NaOH than in NH_4OH, the soly. of $Cu(OH)_2$ and of $Ni(OH)_2$ is greater in NH_4OH. With regard to soln. of cellulose in an NH_3 or NaOH soln. of a metal hydroxide, the obvious requirement is high soly. of the hydroxide and low stability of the complex soln. in contact with the OH groups of the cellulose. If the latter action is considered to run parallel to the hydrolysis by H_2O, the most suitable solns. are $Zn(OH)_2$ in NaOH or $Cu(OH)_2$ in NH_4OH; less active are solns. of $Ni(OH)_2$ in NH_4OH, and $Cu(OH)_2$ or $Co(OH)_2$ in NaOH. A soln. of $Zn(OH)_2$ in NH_4OH cannot be used for dissolving cellulose because of its stability. N. Thon

ca

2

The solubility of copper, zinc, nickel, and cobalt hydroxides in caustic alkali and ammonia. M. I. Arkhipov, A. B. Pakshver, and N. I. Podbornova (Ivanovo Inst. Chem. Eng.). J. Applied Chem. U.S.S.R. 23, 685-91 (1950)(Engl. translation).--See C.A. 44, 8740h.

R. M. S.

BA

BII

5

Properties of solutions of acetylcellulose. A. M. [illegible] and R. I. Dubinin (*J. appl. Chem. U.S.S.R.*, 1950, **23**, [illegible]).—The dissolution of acetylcellulose is accompanied by interaction between the polar groups of macromol. and those of the solvent. The greater is this interaction the better is the solvent. Due to the solvation of the polar groups of the macromol. the chain-like mol. acquire more freedom of rotation. This is manifested by a decrease in η of the solution and increase of conventional d of solute d_0 (measured on the assumption that the d of solvent is const.). The sp. η (η_s), and intrinsic η ($[\eta]$), d_0, and sp. contraction (Δv) have been measured for diacetylcellulose with mol. wt. 68,800 and 84,800 (mol. wt. measured in COMe$_2$, and calculated by method of Hewlett and Minshall, B., 1948, II, 134), in solutions containing 0·05—15% of solute in COMe$_2$, NH$_2$Ph, 90% HCO$_2$H, AcOH, 90% PhOH, a mixture of COMe$_2$ (80%) and EtOH, and a mixture of C$_2$H$_4$Cl$_2$ (80%) and EtOH. The same properties were measured for triacetylcellulose in solutions containing 0·05—10% of solute in AcOH, CH$_2$Cl$_2$, 90% PhOH, and in a mixture of C$_2$H$_4$Cl$_2$ (80%) and EtOH. In all cases except 100% AcOH, an increase in η is accompanied by a decrease in d_0. Assuming solvent power by the decrease in η_s and $[\eta]$ and increase of d_0 all solvents form the following order: for diacetylcellulose: ketones > phenols and alcohols > acids > amines; for triacetylcellulose: acids > phenols > chlorinated hydrocarbons. In case of strong solvents the solvation decreases appreciably with the increase of the content of acetylcellulose in solution, i.e., d_0 decreases with increasing concn. of solute. In the conc. solutions the macromol. are less closely packed and the mobility of macromol. is smaller because of the interaction of their polar groups.

J. B. J. Zaba.

23

CA

Solutions of acetylcellulose. A. B. Pakshver and K. I. Dolmin. *J. Applied Chem.* U.S.S.R. 23, [illegible] (1950) (Engl. translation). Solns. of secondary low mol. acetylcelluloses (I) (mol. wt. 38,000 and 54,500, resp.) and triacetylcellulose (II) (mol. wt. 417,000) were made in concns. of 0.0-12.0%, in various solvents (Me$_2$CO, 80% HCO$_2$H, AcOH, 80% MeEtCO, 80% EtOH, 90% C$_6$H$_5$OH-10 H$_2$O, C$_6$H$_5$NH$_2$, 80% C$_2$H$_4$Cl$_2$-20 EtOH, CH$_2$Cl$_2$), and the intrinsic viscosity, vol. shrinkage, and nominal sp. gr. of the solns. were measured. Soln. of acetylcellulose (III) entails interaction between the macromols., polar groups, and the solvent. The stronger this interaction, the stronger the action of the solvent. The intermol. reactions between the macromols. themselves also have an important effect. Because of solvation of the polar groups of the macromols., the chain mols. acquire greater mobility and, hence, become kinked. Increase in the freedom of rotation of the individual links in the macromol. chains is reflected in a decrease in the soln. viscosity and an increase in d. of the atom arrangement within the solvent-acetylcellulose system. The following rule applies to the different solvents: the lower the specific and intrinsic viscosities, the higher the sp. gr. and sp.-vol. shrinkage of the solns. With diminishing viscosities, the solvents can be arranged in order of decreasing solvent power, for II, I: ketones > phenols and alcs. > acids > amines; for III, acids > phenols > chlorinated hydrocarbons. In strong solvents the degree of solvation drops off as the concn. of III increases, and the sp. gr. and specific shrinkage decrease; the d. of the arrangement of atoms in the given vol. drops off owing to a decrease in the mobility of the macromols., caused in turn by interactions between their polar groups.

S. I. Aronovsky

5

Properties of solutions of polyamide resins. A. B. [illegible] and T. N. [illegible] (J. appl. Chem. USSR, [illegible]).—During the dissolution of polyamide resins in solvents of the type ROH, the solvation of the mol. of polyamide takes place with the formation of the compounds of the type: ·R·CO·NH·R'· with H and ·O·R''·.

Chain-like mol. of polyamide found through their solvation most likely take the folded shape. The solvent power is determined by the intensity of interaction of the mol. of polyamide with mol. of solvent R''OH and is represented by the following series: HCO_2H (complete solubility at room temp. both in 80 and 90% acid) > 100% AcOH (solubility 6, 60, and 100% at 20°, 80°, and 100°) > phenols > mineral acids > higher fatty acids > alcohols and H_2O (e.g., 45% at 65° in 80% MeOH). The experimental measurements of specific η (η_{sp}) and intrinsic η ([η]) contraction in c.c. per g. of resin dissolved in 100 g. of solvent, and d (density of resin in solution) were carried out with a resin obtained by polymerisation of [illegible] with and without the content of monomer and polymers of lower mol. wt. Because the mol. wt. of polyamide resins is comparatively low and because of the dista separating polar groups (CO·NH) in the chain, the mol. are sufficiently flexible without appreciable solvation and *d* therefore decreases only slightly with increase of polyamide concn. and does not change appreciably in different solvents. Thus values of *d* for 5% solution of polyamide purified from monomer in 95·5% H_2SO_4 (I), 85% HCO_2H (II), and 90% phenol (III) are 1·1768, 1·[illegible], and 1·1[illegible]7 and expansion of sp. vol. for the same solvents and same concn. are −0·0[illegible], +0·0[illegible], and −0·0[illegible]. η_{sp} in I, II, and III for 0·05 and 5% solution, of polymer are 0·0[illegible], 0·31, and 0·0[illegible] and 3·24, 0·0[illegible], and 3·23 and [η] in 0·05% solutions of polymer are 1·[illegible], 0·7[illegible], and 0·[illegible]. Monomer (lactam) and ketones ($COMe_2$) increase the solvation of polar groups (CO·NH) and weaken intermol. forces. They therefore decrease η of solution in HCO_2H. With phenols this does not take place because of the pronounced interaction between phenols and the CO groups in lactam and $COMe_2$.

J. B. J. Zaba.

31

CA

The properties of solutions of polyamide resins. A. B. Pakshver and T. N. Kokhomskaya (Ivanovo Inst. Chem. Technol.). *J. Applied Chem. U.S.S.R.* **23**, 883-93(1950)(Engl. translation).—cf. C.A. **46**, 6470e. A study was made of the intrinsic η, vol. contraction on mixing a soln. with the dissolved substance, and the nominal d. of a polyamide resin (I) in soln. in 92.5% H_2SO_4, 89% HCO_2H and 90% PhOH. Three different samples of I, prepd. by polycondensation of caprolactam, were used: (1) contg. no monomer (lactam) or low-mol. admixts. (after extn. with H_2O at 100°), (2) contg. monomer and low-mol. impurities (not extd. with hot H_2O), and (3) contg. no monomer but only low-mol. admixts. Detns. were also made of the percentage soly. of extd. resin (1) in org. acids and alcs. It is concluded that in I the mols. are linked together by powerful intermol. bonds between the CONH groups of neighboring mols. During soln. in compds. of the type ROH, where R = H, $Me(CH_2)_n$, $Me(CH_2)_nCO$, SO_3H, NO_2, Ph, or C_6H_4Me, the mobile H atom of these compds. reacts with the CO group of the polyamide mols. and break the intermol. CO...NH bonds. Solvation of the individual mols. of polyamide takes place. During this process the individual chainlike mols. of polyamide are freed and acquire, most probably, a coiled form. The strength of a solvent is governed by the intensity of reaction of the mols. of polyamides with the mols. of solvent of the ROH type. In respect to solvent strength, different compds. of the ROH type can be arranged in the order: HCO_2H > phenols > inorg. acids and H_2O > aliphatic acids > alcs. and H_2O. Owing to the relatively low mol. wt. of I and the distance between the neighboring polar CONH groups in the chain, these chain mols. possess adequate elasticity without considerable solvation; for this reason the d. of I falls only slightly with rising concn. of I in soln. and undergoes little change in different solvents. Monomer, e.g., lactam, and ketones, e.g., acetone, solvate the polar CONH group, weaken the intermol. bond, and depress the η of the soln. (in inorg. acid). This phenomenon is not observed in PhOH owing to the strong reaction of phenols with the ketonic group of lactam and acetone. Differences between I and cellulose acetate are pointed out. N. K. J.

B

686*. Influence of Mixed Solvents on the Solution of High-Molecular-Weight Substances. (In Russian.) A. B. Pakshver, I. N. Kokhonskaya, and R. I. Dolinin. *Zhurnal Prikladnoi Khimii* (Journal of Applied Chemistry), v. 23, Sept. 1950, p. 900-907.

The solution of acetyl cellulose polyamide resin in a binary mixture, one or both of whose components is incapable of dissolving the given substance alone, but merely causes swelling, was investigated. The solvent action of the nonsolvent is explained theoretically. Data are charted and tabulated.

METALLURGICAL LITERATURE CLASSIFICATION

KUKIN, Georgiy Nikolayevich, prof.; SOLOV'YEV, Aleksey Nikolayevich, prof.; KISELEV, A.K., dotsent, retsenzent; PAKSHVER, A.B., prof., retsenzent; BUDNIKOV, V.I., dotsent, retsenzent; LAZAREVA, S.Ye., kand.tekhn.nauk, retsenzent; LUVISHIS, L.A., kand.tekhn.nauk, retsenzent; TUMAYAN, S.A., kand.tekhn.nauk, retsenzent; SHTEYNGART, M.D., red.; SHVETSOV, S.V., tekhn.red.

[Guide to textile materials] Tekstil'noe materialovedenie. Pod obshchei red. G.N.Kukina. Moskva, Izd-vo nauchno-tekhn.lit-ry. Pt.1. 1961. 303 p. (MIRA 15:4)

1. Ivanovskiy tekstil'nyy institut (for Kiselev). 2. Vsesoyuznyy zaochnyy institut legkoy i tekstil'noy promyshlennosti (for Pakshver). 3. Tashkentskiy tekstil'nyy institut (for Budnikov). 4. Vsesoyuznyy institut promyshlennosti lubyanykh volokon (for Lazareva). 5. TSentral'nyy nauchno-issledovatel'skiy institut sherstyanoy promyshlennosti (for Luvishis). 6. TSentral'nyy nauchno-issledovatel'skiy institut shelkovoy promyshlennosti (for Tumayan).

(Textile fibers)

USSR/Chemistry - Plastics Oct 51

"Solutions of Acetyl Cellulose With Different Acetyl Numbers," A. B. Pakshver, G. K. Kopylova, Lab of Artificial Fibers, Ivanovo Chem-Technol Inst

"Zhur Prik Khim" Vol XXIV, No 10, pp 1052-1057

Sepn of tech acetyl cellulose into fractions distinguished by their percentage of acetyl groups is possible. Addn of H_2O or C_2H_5OH favors soln of fractions with a low percentage of acetate groups, and is unfavorable for soln of those with a high content of acetyl groups. Thus, if H_2O or C_2H_5OH is added, all other conditions being equal, cellulose acetate with

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USSR/Chemistry - Plastics (Contd) Oct 51

high acetyl number will ppt. On addn to the same acetone soln of cellulose acetate of methylene chloride, dichloroethane or other solvents which react only with the $OCOCH_3$ groups, cellulose acetate with low acetyl numbers will settle out.

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PAKSHVER, A.B.

PAKSHVER, A. B.

USSR/Chemistry - Polyamide Fibers Apr 51

"Kinetics of the Heterogeneous Hydrolysis of Polyamide Fibers in Acids," Ye. K. Mankash, A. B. Pakshver, Chemicotech Inst, Ivanovo

"Zhur Fiz Khim" Vol XXV, No 4, pp 468-474

Gives eq describing heterogeneous acid hydrolysis of polyamide and cellulose fibers. Eq permits estn of mol structure of high polymer fibers. Mol structure det susceptibility of fiber to hydrolysis. Lists series of fiber types according to deg of mol orientation as indicated from kinetics of hydrolysis.

1C 180T31

PAKSHVER, A.B.

Kinetic method of investigation of the structure of high polymers. A. B. Pakshver and E. K. Mankash (Chem.-Technol. Inst., Ivanovo). *Khim. i Fiz.-Khim. Vysokomolekul. Soedinenii, Doklady 7-oi Konf. Vysokomolekul. Soedineniyam* 1952, 188-95.—The rate of soln. of regenerated *cellulose* by 10% NaOH is decreased by stretching and aging. Hydrolysis of a *polyamide* by 0.1*N* H_2SO_4 at 100° is similarly affected. The polyamide is tested as spun, aged, and stretched 50, 100, 150, 200, and 380%, the latter before and after setting. 2, 4, and 4.5% solns. of phenol in water cause extension of unstretched polyamide yarn, while contraction occurs for yarn stretched 150% or more. The process of hydrolysis of polyamide and regenerated cellulose in acid medium are evaluated kinetically as diffusion reactions. The assumption of amorphous and cryst. phases appears unnecessary. H. D. Noether

PAKSHYER, A.B.

Chemical Abst.
Vol. 48 No. 8
Apr. 25, 1954
Dyes and Textile Chemistry

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②

✓ Change of viscosity of polyamide fibers during heterogeneous hydrolysis in acid medium. A. B. Pakshver and E. K. Mankash. *Colloid J.* (U.S.S.R.) 14, 125-30 (1952) (Engl. translation).—See *C.A.* 46, 7774e. H. L. H.

PAKSHVER, A. B.

Chemical Abst.
Vol. 48 No. 9
May 10, 1954
General and Physical Chemistry

② Chem

✓ **Kinetics of hydrolysis of caprolactam and of polyamide resin.** V. A. Myaskov and A. B. Pakshver. *Colloid J.* (U.S.S.R.) 14, 193-7(1952)(Engl. translation).—See *C.A.* **46, 8484e.**
H. L. H.

PAKSHVER, A.

USSR/Chemistry - Synthetic Fibers Mar/Apr 52

"Change of the Viscosity of Polyamide Fibers During Heterogenous Hydrolysis in an Acid Medium," A. Pakshver, Ye. Mankash, Ivanovo Chem Tech Inst

"Kolloid Zhur" Vol XIV, No 2, pp 112-117

Change of mol wt and destruction of polyamide fibers under heterogenous conditions in an acid medium has been described by the eq of Rotiniyan and Drozdov ("Zhur Obshch Khim" Vol XIX, p 1843, 1949), by which changes of the rate of fission of amide bonds are expressed as a function of

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diffusion just as in investigating the rate of hydrolysis of high polymers with destruction and change of mol wt, the presence of a multiphase amorphous and cryst fiber structure need not be assumed. The kinetic eq permits estimation of the mol structure of high-mol fibers.

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USSR/Chemistry - Synthetic Fibers May/Jun 52

"The Kinetics of Hydrolysis of Caprolactam and
Polyamide Resins," V. A. Myagkov, A. B. Pakshver,
Ivanov Chem-Technol Inst

"Kolloid Zhur" XIV, No 3, pp 172-176

Hydrolysis of the amide bond in both the monomeric
caprolactam and the polymeric polyamide resin is
a bimolr reaction. Hydroxonium ions and hydroxyl
ions play an active part in it. The apparent energy
of activation of the reaction in an acid medium is

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the same in hydrolysis of lactam and of resin, i.e.,
the mechanism of hydrolysis of amide compds does
not depend on the number of amide bonds in the
mol or on whether it is of a cyclic or chain
structure. Hydrolysis of caprolactam in an alk
medium proceeds about twice as fast and requires
less energy of activation than hydrolysis in an
acid medium.

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PAKSHVER, A. B.

PAKSHVER, A. B.

USSR/Chemistry - Plastics, Synthetic Fibers Nov 52

"Interaction Between Chlorinated Polyvinyl Compounds and Solvents," B. E. Geller, A. B. Pakshver, All-Union Inst of Synthetic Fibers

"Zhur Prik Khim" Vol 25, No 11, pp 1196-1200

After studying the interaction between various polyvinyl compds and organic liquids, a connection was found between the intensity of interamolecular interaction and the magnitude of the contraction

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of the system. The relationship between the properties of the system (contraction, viscosity, coagulation) and the number of hydrogen atoms capable of forming hydrogen bonds of the type -Cl—→H- was pointed out.

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M 236T4

PAKSHVER, A.B.

② 3

Interaction of chlorinated polyvinyl compounds with solvents. B. E. Geller and A. B. Pakshver. *J. Appl. Chem. U.S.S.R.* 25, 1253-6(1953)(Engl. translation).—See *C.A.* 47, 3028*h*. H. L. H.

PAKSHVER, A.B.

The xanthation of cellulose. I. The reaction of carbon disulfide with sodium hydroxide. P. M. Cherkasskaya, A. B. Pakshver, and V. A. Kargin. *Faserforsch. u. Textiltech.* 4, 265-67(1953). See *C.A.* 47, 5228e. **II. The xanthation of simple carbohydrates and of cellulose.** *Ibid.* 439-43.—To gain some information on the kinetics of the xanthation reaction a study is made of the xanthation of simple multivalent alcs. such as sucrose (I) and a degraded hydrate cellulose (II) with a degree of polymerization of 82, which is prepd. by acid hydrolysis of viscose rayon and is completely sol. in aq. alkali. The reactions are carried out in sealed tubes. The reaction products are detd. potentiometrically according to Neiman and Stepanova, *Tekh. Byull. Glavnoe Upravlenie Iskusstven. Volokna* (1937)) and, from the curves obtained, the amt. of xanthate, sulfide, and trithiocarbonate is detd. directly. With II, the degree of xanthation is detd. iodometrically and converted into the γ-no. (the no. of NaCS$_2$O groups/100 glucose groups). The potentiometric and iodometric methods give values that agree well. The reaction of I with CS$_2$ in alk. soln. is studied by detg. the dependency on time and temp. of the reaction products on xanthation, the influence of the ratio of I:CS$_2$:NaOH on the velocity of the xanthation of I with ratios of 1:1:3, 1:4:4, and 1:12:12 at 20 and 40°, the effect of the NaOH concn. on the velocity of the formation of the I xanthate, of Na$_2$S, and of Na$_2$CS$_3$ at 40°, and by detg. the kinetic data of the xanthation of I at 20, 30, and 40°. The results, given in tables, indicate that the xanthation occurs according to the equation: $ROH + NaOH \rightarrow ROH.NaOH$ (III); $III + CS_2 \rightarrow ROCSSNa + H_2O$. The no of reacted OH groups/glucose group is unknown. For low degrees of esterification the following equation is valid for the reaction velocity: $v = k_1c_1c_2$. From the results of the xanthation of I and II, *n* (the no. of reacted OH groups) is found to be about 2. The xanthation of the high-mol. cellulose takes place under heterogeneous conditions and is therefore principally different. Because of diffusion of the CS$_2$ in the surrounding medium or into the interior of the fiber the reaction is permutoid in character or else takes place on the surface. Since the reaction is carried out in sealed tubes it has a much more pronounced permutoid character and is, therefore, considered to be a pseudomonomol. reaction and the following equation is used for its kinetic calcns.: $k_1 = 2.3/t \times \log 1/1 - x$, in which x is the amt. of combined CS$_2$. This equation gives satisfactory values up to a degree of esterification of about 16% (γ = 50).

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The results indicate that in the xanthation of cellulose and of simple sugars 2 independent reactions take place: the reaction of CS_2 with the carbohydrate and with excess NaOH. In the 1st case the velocity of the formation of the xanthate passes through a max. because the equil. is continuously disturbed by side reactions. An increase in alkali concn. decreases the reaction velocity in the xanthation of I, either because OH groups are blocked by NaOH or because the equil. is shifted to the formation of Na_2S and Na_2CS_3. The xanthation of alkali cellulose in a heterogeneous medium can be expressed by an equation of the 1st order as a pseudo-unimol. reaction. Although the reaction should proceed more slowly because of the heterogeneous conditions the velocity, in this case, is somewhat greater than in a homogeneous reaction because, in the latter, there is a considerably larger excess of NaOH present. As compared with I, the process is much slower, particularly on the basis of equal amts. of reagents. By increasing the temp. the main reaction as well as the side reactions can be accelerated, and, in the case of I, the velocity of the main reaction is somewhat greater than that of the side reactions. The retarding effect of the alkali and of the heterogeneous course of the reaction are shown in a decrease in the temp. coeff.

F. E. Brauns

PAKSHYER, A.B.

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5343. Investigations of solutions of "Chlorin" (perchlorovinyl resins). A. M. Bykov and A. B. Pakshver. *Koll. Zhur.*, 1953, 15, 331; *Plast. u. Kaut.*, 1954, 1, 141. The term "Chlorin" is used to cover both chlorinated polyvinyl chloride and polyvinylidene chloride. The solubility, viscosity, and osmotic properties of these polymers in ketone solvents has been investigated, and molecular weight effects are discussed. 352H21.6322.3465

Pakshver G.B.

Solutions of perchlorovinyl resins. A. N. Bykov and A. B. Pakshver. *Colloid J. U.S.S.R.* 15, 329-36(1953)(Engl. translation).—See *C.A.* 48, 1115i. H. L. H.

PAKSEVER, A.B.

Reaction between carbon disulfide and sodium hydroxide. P. M. Cherkasskaya, A. B. Pakshver, and V. A. Kargin. *J. Appl. Chem. U.S.S.R.* [illegible]-66(19[illegible]3)(Engl. translation).—See *C.A.* 47, 5228e.
H. L. H.

FIGH[illegible], V.D.; [illegible]; [illegible], A.D.

Increasing the [illegible] of polyvinyl chloride fibers. [illegible] ([illegible] 1:1[illegible]) 1[illegible]

1. Vsesoyuznyy nauchno-issledovatel'skiy institut [illegible] volokna.