Production of butadiene-styrene (methylstyrene) rubbers..

taining abietene acids (1.8 - 2.5%); hyperis, containing 90.8% hydrogen peroxide; 90.8% monohydrogen peroxide diisopropylbenzene, containing 35% hydrogen peroxide; tertiarydodecylmercaptane, 95% concentrated. An autoclave of periodic action was used. The experimental results led to the following changes in the composition: 94 - 96% butadiene-rectificate; 98.5% methylstyrene, produced by dehydration of isopropylbenzene; disproportionated colophony, produced on a palladium catalyst by the continuous method with acidic number 163 - 164, and containing abietene acids - (2.5 - 4.9%); commercial stearene acid; 95% tertiary dodecylmercaptane d_{20} 0.8616, D_{20} 1.4685; softened water with a total hardness of 0.029 mg.equiv./l and iron content - 0.15 - 0.34%. The resulting SKMS-30 ARKM-15 commercial rubber is characterized by the absence of noticeable quantities of high-molecular fractions. It is similar to SKS-30 ARM-15 and SKMS-30 ARM 15 in its plastic properties mix scorching and spraying resistance. Studies have been conducted on the possibility of further reducing the emulsifier quantity in the production of butadiene--styrene and butadienemethylstyrene rubbers. It was found that: a) by reducing the emulsifier quantity from 5.8 to 5.2 weight parts, the polymerization duration does not change; b) by reducing the emulsifier quantity from 5.8 to 4.8 w.p., the duration remains the same if the trilon B is increased from 0.04 to 0.05 w.p.

Card 2/3

S/020/63/148/002/036/037
B124/B186

AUTHORS: Poddubnyy, I. Ya., Erenburg, Ye. G., Chernova-Ivanova, Ye. P., Kartasheva, G. G.

TITLE: The effect of the association of polybutadiene macromolecules in different solvents

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 148, no. 2, 1963, 384-387

TEXT: The sizes of macromolecules of highly branched potassium butadiene rubber and of linear cis-polybutadiene (the latter being prepared in the presence of a complex catalyst) were investigated using a light-scattering method. Both in solvents with nearly ideal thermodynamic properties and in relatively good solvents aggregation of the dissolved macromolecules was observed. The molecular weights $\overline{M}_w$ and the mean-square radii of the polymer clusters were determined with the polarization nephelometer and a photometric device described by V. N. Tsvetkov et al. (ZhETF, v. 26, 245 (1954)). In addition, the number-average molecular weights $\overline{M}_n$ were determined by the osmotic pressure method and the characteristic viscosities were measured

Card 1/4

S/020/63/148/002/036/037
B124/B186

The effect of the association of...

PRESENTED: September 18, 1962, by V. A. Kargin, Academician

SUBMITTED: August 26, 1962

Table 1. Size and molecular weight of potassium butadiene rubber macromolecules at different temperatures.

Legend: (1) Number of the fraction; (2) Temperature, °C; (3) $M' \cdot 10^3$ (without regard to asymmetry); (4) $\phi' \cdot 10^{-21}$ (ϕ' = Flory's constant).

(1) № фракции	(2) Т-ра, °С	$M' \cdot 10^3$ (3) (без учета асиммет-рии)	$\overline{M}_w \cdot 10^{-3}$	$\overline{M}_w / \overline{M}_n$	[η]	$(\overline{r^2})^{1/2}$, Å	$\Phi' \cdot 10^{-21}$ (4)
B-1	46	1,660	2,260	2,3	1,53	450	32
2	48	1,060	1,390	1,4	1,56	410	31
($\overline{M}_n = 980 \cdot 10^3$)	61	890	1,100	1,1	1,73	370	43
B-2	38	2,000	2,700	3,0	—	430	—
2	48	1,000	1,240	1,4	—	370	—
($\overline{M}_n = 910 \cdot 10^3$)	60	830	1,000	1,1	—	360	—

Card 3/4

Table 2. Size and molecular weight of cis-polybutadiene macromolecules in different Θ-solvents.

Legend: (1) Number of the fraction; (2) Solvent; (3) Temperature, °C; (4) Dioxane; (5) Methyl butyl ketone.

(1) № фракции	(2) Растворитель	(3) Т-ра, °С	$\overline{M}_w \cdot 10^3$	$\overline{M}_w/\overline{M}_n$	[η]	$(\overline{r^2})^{1/2}$; Å	$\Phi' \cdot 10^{-21}$	$A_2 \cdot 10^4$
Д-2	(4)							
1	Диоксан	21	1,040	2,1	1,45	430	19	2,7
($\overline{M}_n = 500 \cdot 10^3$)		25	1,050	2,1	—	430	—	4,6
		30	1,100	2,2	—	460	—	6,7
		40	1,100	2,2	—	460	—	10,0
Д-3	(4)							
2	Диоксан	20	1,500	3,9	1,48	570	12	0
($\overline{M}_n = 390 \cdot 10^3$).	Метилбутил-кетон (5)	25	700	1,8	1,37	410	14	8,0
		50	750	1,9	—	450	—	15,0

Card 4/4

S/734/61/000/000/001/003
I060/I260

AUTHOR: Poddubnyy, I.Ya., Nel'son, I.V., and Zdolotareva, R.V.

TITLE: Spectrophotometric method of determination of impurities of divinylacetylene in vinylacetylene

SOURCE: Leningrad. Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka. Fiziko-khimicheskiye metody analiza i issledovaniya produktov proizvodstva sinteticheskogo kauchuka. Leningrad, 1961. 73-87

TEXT: The purpose of this work was to develop a new, more sensitive method of detection of impurities of vinylacetylene, because the presence of even 0.05% of divinylacetylene affects the quality of synthetic rubber. The method used was that of spectrophotometric analysis in the ultraviolet region of the spectrum. Spectrophotometer СФ-4 (SF-4) was used with quartz optical elements designed for work in the 220-1100 mμ region. Both divinylacetylene and vinylacetylene were analyzed as solutions in alcohol. The selected maximum was 265.6 mμ. It has been proved that other impurities present

Card 1/2

S/734/61/000/000/001/003
I060/I260

Spectrophotometric method...

in industrial vinylacetylene, such as acetylene, acetaldehyde, vinyl chloride and xylene do not interfere with the analysis, so that a binary mixture vinylacetylene-divinyl-acetylene can be used for research work. Thickness of the cuvettes used was such that the optical density of the solution varied between 0.3 and 0.7. These results follow strictly the Bouguer-Lambert-Beer law. The above described method has been checked in industrial conditions on a large number of samples with satisfactory results. There are 4 figures and 1 table.

Card 2/2

S/844/62/000/000/096/129
D204/D307

AUTHORS: Poddubnyy, I. Ya. and Aver'yanov, S. V.

TITLE: Vulcanization of siloxane rubbers under the action of γ radiation

SOURCE: Trudy II Vsesoyuznogo soveshchaniya po radiatsionnoy khimii. Ed. by L. S. Polak. Moscow, Izd-vo AN SSSR, 1962, 563-568

TEXT: The present work was aimed at the production of vulcanized siloxane rubbers (polydimethylsiloxane СКТ (SKT) and polyvinylmethylsiloxane СКТВ (SKTV)) possessing high thermal and temperature stability, improving their physico-chemical properties by suitable additives. Vulcanization was carried out under γ irradiation (0.28 - 0.72 r/hr) in the usual manner. Tensile strength and relative elongation of both rubbers could be increased by e.g. replacing ZnO, in a mixture containing 50 parts by weight of powdered silica gel, with Fe_2O_3 or ZrO_2, or by pre-refining of additives based on silica gel. Additives of chimney soot increased the physico-mechanical in-

Card 1/3

Vulcanization of siloxane ... S/844/62/000/000/096/129
D204/D307

tulated for both rubbers above 330°C; SKTV also gives rise to some $\geq Si-(CH_2)_3-Si\leq$ under irradiation. The high thermal stability is connected with the formation of stable silicates with the multivalent metals introduced as additives. The participation of V. N. Kartsev, Yu. V. Trenke, L. A. Aver'yanov and V. F. Yevdokimov in this study is acknowledged. There are 3 tables.

ASSOCIATION: Vsesoyuznyy NII sinteticheskogo kauchuka (All-Union NII of Synthetic Rubber)

Card 3/3

PODDUBNYY, I.Ya.; ERENBURG, Ye.G.

Characteristics of branching of isoprene polymers having a regular structure. Vysokom.soed. 4 no.7:961-967 Jl '62. (MIRA 15:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka imeni S.V. Lebedeva.
(Isoprene)

GENKIN, A.N.; NASONOVA, T.P.; PODDUBNYY, I.Ya.; SHLYAKHTER, R.A.

Molecular weight distribution of low molecular weight thiocols by the chromatographic fractionation method. Vysokom.soed. 4 no.7:1088-1092 Jl '62. (MIRA 15:7)

1. Nauchno-issledovatel'skiy institut sinteticheskogo kauchuka.
(Guaiacolsulfonic acid) (Chromatographic analysis)

PODDUBNYY, I.Ya.; KARTSEV, V.N.; AVER'YANOV, S.V.; TRENKE, Yu.V.; AVER'YANOVA, L.A.; YEVDOKIMOV, V.F.

Vulcanization of polydimethysiloxane rubber subjected to radiation. Kauch.i rez. 19 no.9:5-15 S '60. (MIRA 13:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka im. S.V.Lebedeva.

(Siloxane) (Gamma rays) (Vulcanization)

BRESLER, S.Ye.; MOSEVITSKIY, M.I.; PODDUBNYY, I.Ya.; SHI GUAN'-I [Shih Kuan-i]

Effect of the structure of the organoaluminum component of a complex catalyst on the character of isoprene polymerization. Vysokom.soed. 3 no.10:1591-1596 O '61. (MIRA 14:9)

1. Institut vysokomolekulyarnykh soyedineniy AN SSSR i Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka imeni S.V. Lebedeva.
(Isoprene) (Polymerization) (Catalysts)

YEVDOKIMOV, V.F.; PODDUBNYY, I.Ya.; KUZIN, I.A.

Titanium and tin tetrachlorides as acceptors of radicals in hydrocarbon radiolysis. Dokl. AN SSSR 141 no.5:1097-1100 D '61. (MIRA 14:12)

1. Nauchno-issledovatel'skiy institut sinteticheskogo kauchuka im. S.V. Lebedeva. Predstavleno akademikom S.S. Medvedevym.

(Radicals (Chemistry)) (Radiation)
(Chlorides)

S/081/62/000/001/065/067
B119/B101

AUTHORS: Fikhtengol'ts, V. S., Babikov, O. I., Peyzner, A. B., Poddubnyy, I. Ya., Zolotareva, R. V.

TITLE: Ultrasonic method for determining the conversion degree during polymerization in emulsion

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 1, 1962, 535, abstract 1P230 (Vestn. tekhn. i ekon. inform. N.-i. in-t tekhn.-ekon. issled. Gos. kom-ta Sov. Min. SSSR po khimii, no. 10, 1960, 28)

TEXT: There is a linear relationship between the propagation velocity of ultrasonics and the content of dry residue (polymer) in chloroprene and butadiene styrene latexes containing no monomer. The polymer composition (butadiene/styrene ratio) affects the change of ultrasonic velocity with increasing concentration. The dependence of ultrasonic velocity on the conversion degree of latex is not linear: at first the velocity changes slowly, then it increases rapidly, and drops again toward the end of the process owing to the presence of monomer. A decrease of the monomer

Card 1/2

31619
S/138/61/000/012/001/008
A051/A126

15.9205

AUTHORS: Aver'yanov, S.V.; Poddubnyy, I.Ya.; Trenke, Yu.V.; Aver'yanova, L.A.

TITLE: Vulcanization of methylsiloxane rubber with a low vinyl group content, under action of γ-emission

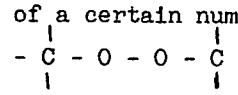
PERIODICAL: Kauchuk i rezina, no. 12, 1961, 1 - 7

TEXT: An investigation was conducted to determine the conditions for producing highly heat-resistant radiation vulcanizates of the CKTB (SKTV) rubber. The possibility was studied for producing rubbers of even higher heat-resistance by introducing compounds into the rubber mix which would increase the magnitude of the intermolecular action in the system and the effective tensility of the bonds in the vulcanizates, as well as by changing the conditions of emission. Laboratory samples of methylvinylsiloxane SKTV-0.07 rubber, with a molecular weight of 400 - 500 thousand, were investigated. The energy of the γ-emission dose was held within the limits of 0.28 to 0.72 Mr/h. A study of the tensility of the γ-emission vulcanizates of the SKTV-0.07 rubber, filled with various silica gels and carbon blacks, showed that the introduction of met-

Card 1/3

Vulcanization of methylsiloxane rubber with a ....

als with varying valencies into the silica gel filled rubber mixes increases the physico-mechanical indices considerably. Preliminary refining of the rubber mixes further increases the physico-mechanical indices. Experiments showed that rubbers, retaining satisfactory tensile and elastic properties, can be produced from the above-mentioned sample, after thermal aging at a temperature of 380°C. The additional increase of the heat-resistance in the given rubbers is achieved by radiation vulcanization in a vacuum and by introducing a halogenated polymer into the rubber mixture. In the latter case, vulcanizates are produced which retain satisfactory tensility and elasticity after short-time aging at 400°C. A study of the effect of metal compounds of varying valencies and of the halogenated polymer after introduction into the rubber mix revealed that the former, being centers of secondary electron radiation, lead to the formation of more regular vulcanization network and, subsequently, to a further increase in the heat-resistance of the radiation vulcanizates. The SKTV radiation vulcanizates show a characteristic intensified destruction in the initial period of the thermal aging, which is thought to be connected with the presence of a certain number of weak oxygen-containing transverse bonds of the



- type in the radiation vulcanizates. These bonds, in turn,

Vulcanization of methylsiloxane rubber with a .....

are formed through the reaction of oxidation of the molecular chains of the polysiloxanes under the action of irradiation. The radiation vulcanizates of the SKTV-0.07 rubber were found to exceed corresponding peroxide vulcanizates in their heat-resistance and thermal stability in a closed system at 200 and 250°C and at increased pressure. The former have a lower residual deformation after compression at 150 - 250°C and a somewhat higher frost-resistance. There are 5 tables, 1 figure and 10 references: 6 Soviet-bloc and 4 non-Soviet-bloc. The reference to the most recent English-language publication reads as follows: L. E. St. Pierre, H.A. Dewhurst, J. Phys. Chem., 64, no. 8, 1,060 (1960).

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka im. S.V. Lebedeva (All-Union Scientific-Research Institute of Synthetic Rubber im. S.V. Lebedev)

X

PODDUBNYY, I.Ya.; AVER'YANOV, S.V.; AVER'YANOVA, L.A.

Nature and strength of cross-linkages in radiation vulcanizates of polysiloxane rubbers. Dokl. AN SSSR 139 no.3:651-653 Jl '61. (MIRA 14:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka im. S.V. Lebedeva. Predstavleno akademikom S.S. Medvedevym. (Siloxane) (Rubber, Synthetic--Testing) (Vulcanization)

32317
S/020/61/141/005/010/019
B103/B110

5.4600 (also 1304)

AUTHORS: Yevdokimov, V. F., Poddubnyy, I. Ya., and Kuzin, I. A.

TITLE: Titanium and tin tetrachlorides as acceptors of radicals in the radiolysis of hydrocarbons

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no. 5, 1961, 1097-1100

TEXT: The radiochemical reduction of $TiCl_4$ and $SnCl_4$ dissolved in hydrocarbons by Co^{60} gamma radiation and the possibilities of using the reaction for initiating the polymerization were studied. The following mixtures were irradiated in glass ampullas. (1) $TiCl_4$ - n-octane; (2) $TiCl_4$ - benzene; (3) $SnCl_4$ - n-octane; and (4) $SnCl_4$ - octamethyl cyclotetrasiloxane. The solutions were degassed; then, the ampullas were evacuated and sealed. After removal of the liquid products of radiolysis and drying in vacuo at 120°C the subchloride precipitations were analyzed by potentiometric titration with silver chloride and platinum electrodes. The quantity of the energy absorbed was determined by ferrous sulfate dosimetry. The yield of the reaction was assumed to be 15.6 molecules

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Titanium and tin tetrachlorides

100 ev. The apparatus has been described previously (Ref. 1: A. K. Breger, V. A. Belynskiy et al., Sborn. Deystviye ioniz[illegible]shchikh izlucheniy na neorganicheskiye i organicheskiye sistemy (Effect of ionizing radiations on inorganic and organic systems) Izd. AS SSSR [illegible], p. 379). A loose gradually concentrating brown precipitate forms ... irradiation of the mixture (1)-(4). Fig. 1 (curve 2) shows the rad... chemical yield G of the reduction of $TiCl_4$ in n-octane solutions ... benzene solutions G_{TiCl_4} is smaller by one power of ten ... maximum value reaches 0.75 (in agreement with literature data). T... ultimate analysis shows that the precipitations formed are $Ti...$ completely dissolved in dry N,N-dimethyl formamide. The prod... modification produced was used as component of a Ziegler catalyst (β-$TiCl_3$ + (iso-C_4H_9)$_3$Al$_2$Cl$_3$) and showed normal catalytic activity in the polymerization of diolefins. The epr spectrum of the [illegible] at 77°K belongs presumably to Ti^{3+} and is stable at 7[illegible]°K. The width ... the lines between the two maxima was 22 oersted. The g factor of the signal center is 1.91. The relevant susceptibility was [illegible]

Card 2/5

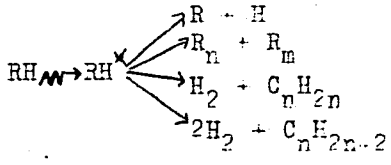
Titanium and tin tetrachlorides ...

picryl hydrazyl. The intensity of the spectrum increases linearly with increasing $TiCl_4$ concentration. At the same time, the existence of the epr spectrum of the hydrogen atom stabilized on the quartz surface was confirmed $SnCl_2$ is precipitated by irradiation of the mixtures (3) and (4). G_{SnCl_4} is shown in Fig. 1 (curve 1). Since it was shown by K. A. Andrianov, S. Ye. Yakushkina (Ref. 13: Vysokomolek. soyed. v. 10, 1508 (1960)), that the polymerization of octamethyl cyclotetrasiloxane is effected by $SnCl_4$ at 120-150°C with simultaneous breaking of the ring, this reaction was performed under the effect of ionizing radiation at room temperature. Simultaneously the polymer formed was chlorinated by reduction of $SnCl_4$ to $SnCl_2$. The Cl content in the polymer reached 3 mole-% with radiation doses of about 30,000,000 r. The molecular weight of the polymer increases with increasing $SnCl_4$ concentration. The CH_4/H_2 ratio in the gases escaping on irradiation of octamethyl cyclotetrasiloxane remains constant in a wide range of doses up to 45,000,000 r. Addition of $SnCl_4$ increases the CH_4/H_2 ratio in this range of doses. Thus, the H atom

Card 3/5

Titanium and tin tetrachlorides

is more active than the CH_3 radical in $SnCl_4$ reduction effected by irradiation. The following possible types of initial reactions are indicated:



(1)
(2)
(3)
(4)

The free radicals formed according to (1) and (2) may interact with $TiCl_4$ and $SnCl_4$: $TiCl_4 + H \longrightarrow TiCl_3 + HCl$, $TiCl_4 + R^{\cdot} \longrightarrow TiCl_3 \cdot RCl$. Moreover, a redistribution of the energy absorbed is not impossible in the relevant two-component system, if the tetrachloride concentrations are increased. There are 4 figures and 14 references: 10 Soviet and 4 non-Soviet. The three most recent references to English-language publications read as follows: H. A. Schwarz, J. Am. Chem. Soc., 79, 334 (1957); Krebs, H. Dewhurst, J. Chem. Phys., 17, 1337 (1949); C. H. Bamford, A. D. Jenkins, R. Johnston, Proc. Roy. Soc., A 239, 214 (1957)

Card 4/4

28189
S/190/61/003/010/019/019
B124/B110

15.8150

AUTHORS: Bresler, S. Ye., Mosevitskiy, M. I., Poddubnyy, I. Ya., Shih Kuan-i

TITLE: Effect of the structure of the organoaluminum component of a complex catalyst on the character of isoprene polymerization

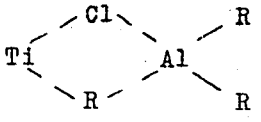
PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 10, 1961, 1591-1596

TEXT: The authors studied the different catalytic activity of the polymerization centers in the interaction of β-$TiCl_3$ with $Al(iso\text{-}C_4H_9)_3$ on the one hand, and with $AlCl(iso\text{-}C_4H_9)_2$ on the other. They investigated the polymerization of pure isoprene (without a solvent) in the presence of catalysts with the initial components $TiCl_4$ and $Al(iso\text{-}C_4H_9)_3$. In Ref. 7 (Vysokomolek. soyed. 3, 820, 1961), the authors had described the methods of polymerization, the calculation of molecular weights and their distribution in the polymers. Results are shown in the Table. An exchange reaction on the active center of the growing polymer chain is assumed:

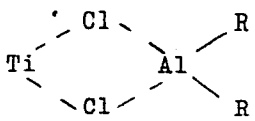
Card 1/4

Effect of the structure of ...

$Cl_2TiClRAlRP + AlR_3 \longrightarrow Cl_2TiClRAlR_2 + R_2AlP$, where P is a polymer radical. A new macromolecular starts growing, and the polymer chain with the Al atom at the end enters into solution. Polymer chains with Al atoms at the end are also formed in the spontaneous dissociation of the catalyst complex at the bridge bond. The dependence of the polymerization rate of isoprene on the composition of the organoaluminum compounds is explained as a consequence of its direct participation in the polymerization. This dependence particularly occurs at low temperatures at which the further reduction of titanium is inhibited by trialkyl aluminum. The different polymerization rates of isoprene may be a consequence of the different adsorption capacity of $Al(iso\text{-}C_4H_9)_3$ and $AlCl(iso\text{-}C_4H_9)_2$ on the surface of $\beta\text{-}TiCl_3$ or of the different electron density of the bonds Al - C in the system $TiCl_3$ - AlR_3:



(I) and $TiCl_3$ - $AlClR_2$



(II), which

Card 2/4

159450 1436, 1526, 2209

25724
S/020/61/139/003/023/025
B127/B206

AUTHORS: Poddubnyy, I. Ya., Aver'yanov, S. V., and Aver'yanova, L. A.

TITLE: Type and stability of crosslinks in radiation vulcanizates of polysiloxane rubber

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 139, no. 3, 1961, 651-653

TEXT: The authors had previously established that irradiated vulcanization of polydimethyl siloxane rubber СКТ (SKT) leads to higher thermal stability of the rubber obtained (Kauchuk i rezina, 19, no. 9, 5 (1960)). The same occurs in the case of polymethyl vinyl siloxane rubber СКТВ (SKTV) with a content of about 0.1 % vinyl groups. The thermal stability of vulcanizates developed through irradiation may be increased by previous addition of metal compounds of variable valency or SiO_2. This thermal stability exceeds that of peroxide vulcanization. This cannot be explained only by the presence of especially active radicals, but it is also linked with the structure of the network of the vulcanizates developed through irradiation. While $\rightarrow Si-CH_2-Si\leftarrow$ and $\rightarrow Si-Si\leftarrow$ crosslinks are formed during peroxide

Card 1/3

Type and stability of crosslinks in...

vulcanization of polydimethyl siloxanes, $\gtrless Si-CH_2-CH_2-Si \lessgtr$ is to be assumed as the basic type of crosslinks for radiation vulcanizates which develop by recombination of free $\gtrless Si-CH_3$ radicals. This difference contributes to the increase in thermal stability, both due to higher stability of the C—C bond compared with the Si—Si or Si—C bond, and to formation of double bonds at higher temperatures after the reaction

$$\gtrless Si-CH_2-CH_2-Si \lessgtr \rightarrow \gtrless Si-CH=CH-Si \lessgtr ,$$

where no break of crosslinks and no destruction of radiation vulcanizates occurs. Longer CH_2 chains may be formed during vulcanization of SKTV rubber by means of irradiation. Vulcanizates having a more uniform structure of the network as compared with peroxide vulcanizates are obtained by irradiation. Similar results were obtained with experiments in vacuum under prevention of weak crosslinks with oxygen: $-\overset{|}{\underset{|}{C}}-O-O-\overset{|}{\underset{|}{C}}-$. The effect of admixed metal compounds with variable valency is explained by formation of centers of secondary electron radiation favoring a uniform structure formation. There are 3 tables and 2 Soviet-bloc references.

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25724
S/020/61/139/003/023/025
B127/B206

Type and stability of crosslinks in...

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka im. S. V. Lebedeva (All-Union Scientific Research Institute of Synthetic Rubber imeni S. V. Lebedev)

PRESENTED: February 15, 1961, by S. S. Medvedev, Academician

SUBMITTED: February 8, 1961

Card 3/3

occurring on detachment or attachment of the chain to the wall is proportional to the difference between the statistical sums of the free and bound chain. The number of possible configurations for z links is $\nu_z = \gamma(\gamma-1)^{z-2} \simeq (\gamma-1)^{z-1}$, where γ = coordination number. The configuration entropy is $S_z = k \cdot \ln \nu_z \simeq k(z-1)\ln(\gamma-1)$ (2). The configuration entropy of a unilaterally bound molecule was determined at: $S'_z = k \ln \nu'_z \simeq k(z-1)\ln(\gamma-1) - kz^{1/2}$ (7), with $\Delta S = k(3/2\pi)^{1/2} z^{1/2}$. The alkyl or haloalkyl aluminum group at the active end of the chain forms a bridge bond with energy 10-15 kcal/mole with the titanium halide of the catalyst. Termination and dissociation of the catalyst complex occur at this point. The rate constant is given by: $K = (kT/h) \cdot \exp[-(\Delta U^* - T\Delta S)/kT]$, where k = Boltzmann constant, h = Planck constant, ΔU^* = activation energy, ΔS = activation entropy. Since the rate constant K_1 of termination is $K_1 = 10^2 - 10^4$ sec^{-1}, the polymer chain must be repeatedly ruptured during dissociation. The molecular weight distribution reads:

Specific chain limiting mechanism in...

$$\frac{dw}{dM} = \frac{\frac{1}{2}\left(\frac{3M}{2\pi r M_0}\right)^{1/2} e^{-\frac{\Delta U}{RT}+\left(\frac{3M}{2\pi r M_0}\right)^{1/2}}}{\left(1+e^{-\frac{\Delta U}{RT}+\left(\frac{3M}{2\pi r M_0}\right)^{1/2}}\right)^2}, \qquad (16)$$

The activation energy is $\Delta U = RT(3\overline{M}_p/2\pi r M_0)^{1/2}$ (18). A maximum in the molecular weight distribution curve was found at

$$\overline{M}_p = [2\pi r M_0 (\Delta U)^2/3R^2]\cdot(1/T^2) \qquad (19),$$

$\overline{M}_p$ thus being proportional $1/T^2$. Isoprene was polymerized in pure state (I) and in the form of a 25 % solution (II) in hexane, octane, and benzene; butadiene in a 25 % solution (III) in octane. $TiCl_4 + Al(iso\text{-}C_4H_9)_3$ was used as catalyst. For (I), the ratio $TiCl_4$/monomer was 1:3000 and for (II) and (III) 1:800. The molecular weight and molecular weight distribution of polyisopropylene was measured sedimentometrically in octane, using an ultracentrifuge with a Svensson optical system and phase contrast plate at

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46,000 rpm, corresponding to 150,000 g, that of polybutadiene in a mixture of hexane and heptane (1:1) at concentrations between 0.05 and 0.25 %. For polyisoprene in octane at 20°C, the authors obtained $S_o = 0.0447 \cdot M^{0.416}$ (S_o = sedimentation constant). To exclude interfering mechanisms such as transfer and thermal inactivation, polymerization was performed at 20-30°C with a catalyst stored for several hours at room temperature and having a component ratio 1:1. The molecular weight distribution curves for polyisopropylene shown in Fig. 1,a and 6 show little spread and no low-molecular fractions. In accordance with Eq. (19), the polymerization temperature leads to an increased relative spread and lower molecular weights. The formation of a low-molecular polydisperse polymer ($M \simeq 160,000$) at 60°C is due to the socalled "thermal" factor. Free triisobutyl aluminum in the catalyst may also cause termination. The active centers are regenerated under the influence of unbound organo-aluminum compounds. The partial formation of low-molecular components on freshly prepared catalyst is probably due to the absence of maturation and the unification of active centers. This phenomenon is still under study. Provided the number of monomer units r (e.g. 4) of the growing macromolecule is known, the bond

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energy of the growing macromolecule $\Delta U = 2.303[(3.5\cdot10^5)/(2\pi\cdot4.68)]^{1/2}$ $\simeq$17,000 cal/mole may be found by inserting the experimental $\bar{M}_p$ values (e.g. $\bar{M}_p \simeq 5\cdot10^5$ at 30°C) in (18). Similar relations were found in the case of polybutadiene (Fig. 3). There are 3 figures and 7 references: 3 Soviet-bloc and 4 non-Soviet-bloc. The reference to the English-language publication reads as follows: Ref. 1: G. Natta, J. Polymer Sci., 34, 21, 1959.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka im. S. V. Lebedeva (All-Union Scientific Research Institute of Synthetic Rubber imeni S. V. Lebedev). Institut vysokomolekulyarnykh soyedineniy AN SSSR (Institute of High Molecular Compounds AS USSR)

SUBMITTED: December 21, 1960

Card 5/7

5.3830
11.2215

24044
S/020/61/138/003/016/017
B103/B208

AUTHORS: Sokolov, V. N., Poddubnyy, I. Ya., Perekalin, V. V., and Yevdokimov, V. F.

TITLE: Polymerization of nitroethylene under the action of γ-radiation

PERIODICAL: Doklady Akademii nauk SSSR, v. 138, no. 3, 1961, 619-620

TEXT: The authors devised methods for the industrial production of high-molecular nitroethylene under the action of γ-radiation since in this case products are obtained which are as pure as the initial monomers. Other methods with initiator and solvent yielded so far only powdery products contaminated by initiator and solvent. Co^{60} was used as radiation source, the apparatus is described by A. Kh. Breger et al. (Ref. 9: Deystviye ioniziruyushchikh izlucheniy na neorganicheskiye i organicheskiye polimernyye sistemy (Effect of ionizing radiation on inorganic and organic polymer systems), Izd. AN SSSR, 1958). The initial nitroethylene was obtained by dehydration of 1-nitro-ethanol-2 with phthalic anhydride. Fractions with a boiling point of 36°C/100 mm Hg were isolated from the monomer by

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repeated fractionation. Hot nitrogen was bubbled through glass ampuls which were then filled with freshly distilled nitroethylene. The occluded atmospheric oxygen was removed by the usual freezing up and melting. The ampuls sealed in vacuo were irradiated at 20°C, and the monomer was distilled off in vacuo after opening. At the beginning of irradiation (dose $1 \cdot 10^6$ r), a turbidity was observed in the monomer which had hitherto been as clear as water. At a dose of $5 \cdot 10^6$ r a white precipitate results which is identical with the polymer resulting under the action of organic bases. On further irradiation, the pasty monomer-polymer mixture is converted to a transparent, pale-yellow polymer block. This is apparently related to secondary addition reactions of growing polymer chains to the polymer already formed, and is accompanied by an increase of its molecular weight. At doses > 0.3 Mr/hr no block polymer is formed. In this case the polymer remains powdery up to a 100% conversion, and turns light-brown. The formation of the block polymer being a very complicated physico-chemical process depending on many factors, a powder is formed in some cases even with a 100% conversion. The polymerization of partly

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polymerized samples continues also after irradiation is finished. This suggests the formation of rather long-live polymer radicals under the action of γ-radiation (Fig. 2). Also in this case block-polynitroethylene results. The polymerization is inhibited by hydroquinone and oxygen which confirms the radical nature of this process. The polymer is insoluble in common solvents, well soluble in N,N-dimethyl formamide. Its intrinsic viscosity in this solvent is 0.38 which corresponds to a molecular weight of 38,000. Its density is d_{20} 1.535, the decomposition temperature 150°C. No denitrification $(- CH_2 - CHNO_2^-)_n$ takes place during irradiation. The crystalline phase is absent (X-ray data by S. G. Strunskiy). An intense narrow halo and a weak broad halo correspond to the parameters of the short-range order 5.15 Å and 3.73 Å. Under the action of γ-radiation nitroethylene may be copolymerized with other unsaturated nitro compounds such as 1,4-dinitro-butadiene-1,3. There are 3 figures and 9 references: 3 Soviet-bloc and 6 non-Soviet-bloc. The two most important references to English-language publications read as follows: Ref. 4: D. Vofsi, A. Katchalsky. J. Polym. Sci., 26, 127 (1957); Ref. 7: G. Buckley,

Card 3/5

24044
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Polymerization of nitroethylene ...

C. Scaife. Brit. Pat. 595282, 1947; Chem. Abstr., 42, 37775 (1948).

PRESENTED: December 20, 1960, by N. N. Semenov, Academician

SUBMITTED: December 17, 1960

Card 4/5

PODDUBNYY, I. YA.

PHASE I BOOK EXPLOITATION SOV/4983

International symposium on macromolecular chemistry. Moscow, 1960.

Mezhdunarodnyy simpozium po makromolekulyarnoy khimii, SSSR, Moskva, 14-18 iyunya 1960 g; doklady i avtoreferaty. Sektsiya II. (International Symposium on Macromolecular Chemistry. Held in Moscow, June 14-18; Papers and Summaries) Section II. [Moscow, Izd-vo AN SSSR, 1960] 559 p. 5,500 copies printed.

Sponsoring Agency: The International Union of Pure and Applied Chemistry, Commission on Macromolecular Chemistry

Tech. Ed.: T.A. Prusakova.

PURPOSE: This book is intended for chemists interested in polymerization reactions and the synthesis of high-molecular compounds.

COVERAGE: This is Section II of a multivolume work containing papers on macromolecular chemistry. The papers in this volume treat mainly the kinetics of various polymerization reactions initiated by different catalysts or induced by radiation. Among the research techniques discussed are electron paramagnetic resonance spectroscopy and light-scattering interpolation. There are summaries in English, French and Russian. No personalities are mentioned. References follow each article.

PODDUBNYY, I. YA.

To be submitted for the International Symposium on Macromolecular Chemistry, Montreal, Canada, 27 Jul -1 Aug 1961.

USSR

BIRSHTEYN, T. M., Institute of High Molecular Chemistry, Academy of Sciences USSR, Leningrad, jointly with KRIGBAUM, W. R., and KANEKO, M., Duke University, Durham, N.C. - "Elasticity of cube lattice chain networks" (Group 2)

DOGADKIN, Boris A., and DONTSOV, A. A., Moscow Institute of Fine Chemical Technology imeni M. V. Lomonosov - "Interaction of polyethylene with sulphur" (Groups 4-5)

KARGIN, Valentin A., Head, Laboratory of Colloidal Chemistry, Scientific Research Physico-Chemical Institute imeni L. Ya. Karpov, Moscow - "The formation of big crystal structures in polymers and their properties" (Group 2. Invited lecture)

KRENTSEL', B. A., TOPCHIYEV, A. V., and BAKALO, L. A., Institute of Petroleum, Academy of Sciences USSR, Moscow - "Polymerization of some epoxy compounds" (Group 3-B)

MEDVEDEV, Sergey S., SPIRIN, YU. A., AREST-YAKUBOVICH, A. A., POLYAKOV, D. K., and GANTMAKHER, A. R., Scientific Research Physico-Chemical Institute imeni L. Ya. Karpov, Moscow - "Polymerization catalyzed by lithium and lithium alkyl" (In German) (Group 3-B)

NAMETKIN, N. S., TOPCHIYEV, A. V., and POLAK, L. S., Institute of Petrochemical Synthesis, Academy of Sciences USSR, Moscow - "On the catalytic polymerization and radiochemistry of allylsilans" (Group 3-A)

PIOTROVSKIY, K. B., All-Union Scientific Research Institute of Synthetic Rubber imeni S. V. Lebedev, Leningrad - "Temperature effect on polymer structure in diene polymerization by alkali metals" (Group 3-B)

PODDUBNYY, I. Ya., and YERENBURG, Ye. G., All-Union Scientific Research Institute of Synthetic Rubber, Leningrad - "Study of branching in regular isoprene polymers" (Group 1)

PODDUBNYI, I. Ya. MOSEVITSKIY, M. I. RABINERZON, M. A., and PROKOFYEV, A. A. All-Union Scientific Research Institute of Synthetic Rubber imeni S. V. Lebedev, Leningrad - "Nature of molecular-weight distribution and properties of styrene-butadiene rubbers depending on polymerization conditions" (Group 3-A)

PRAVEDNIKOV, A. N., TELESHOV, Ye. N., YIN, She-k'ang, and MEDVEDEV, S. S., Scientific Research Physico-Chemical Institute imeni L. Ya. Karpov, Moscow - "Investigation of the mechanism of radiolysis of polymers containing quaternary atoms of carbon" (Group 4-5) V. N.

TSVETKOV, Viktor N., Institute of High Molecular Compounds of the Academy of Sciences USSR, Leningrad - "Stereo-regularity and optical anisotropy of macromolecules" (Group not specified)

USMANOV, Khamdam U., and SUSHKEVICH, T. I., Academy of Sciences UzSSR, Tashkent, Uzbekistan - "The investigation of the cotton cellulose polydispersity according to the molecular weight" (Group not specified)

YENIKOLOPYAN, N. S., Institute of Chemical Physics of the Academy of Sciences USSR, Moscow - "On the kinetics of formaldehyde polymerization and polyformaldehyde degradation" (Group 3-B)

PODDUBNYY, I. Ya.; RABINERZON, M. A.

"Regulirovaniye molekulyarno-vesovogo raspredeleniya polimerov v protsesse polucheniya butadienstirol'nykh i butadiennitril'nykh kauchukov."

report submitted for 35th Intl Cong, Industrial Chemistry, Warsaw, 15-19 Sep 64.

Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchka im S. V. Lebedev, Leningrad.

PODDUBNYY, I. Ya., BRESLER, S. E., SCHI Guan-i, and MOSEVITSKIY, M. I. (USSR)

Issledovanie nekotorykh detalei mekhanizma polimerizatsii pod deistviem kompleksnykh katalizatorov
Some details of the mechanism of complex catalyst polymerization
IUPAC S II:372-7

report presented at the Intl. Symposium on Macromolecular Chemistry, Moscow, 14-18 June 60.

85412

15.9201

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S/190/60/002/011/006/027
B004/B060

AUTHORS: Poddubnyy, I. Ya., Erenburg, Ye. G.

TITLE: A Study of the Ramification of Butadiene Rubbers 16

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 11, pp. 1625 - 1634

TEXT: In order to provide evidence of a ramification in the macromolecules of butadiene rubbers, the authors started from P. J. Flory's theory (Ref. 12) and determined the intrinsic viscosity $[\eta]$ in the "ideal" solvent. Flory's equation is written down: $[\eta] = \Phi'(\overline{r^2})^{3/2}/M$ (1), where M is the molecular weight of the polymer, $\overline{r^2}$ the mean square radius of the coiled molecule, Φ' Flory's universal constant. The following derivation is made for ramified molecules: $[\eta]^{2/3}/M^{1/3} = K^{2/3}g + 2C'_M\psi_1 K^{5/3}(1 - \Theta/T)(Mg^{5/2}/[\eta])$ (2a). $K = \Phi'(\overline{r_0^2})^{3/2}$, C'_M is a constant (independent of the molecular weight) for the polymer - solvent system concerned, g is the

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A Study of the Ramification of Butadiene Rubbers

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ratio of the mean square $\overline{r^2_{\nu 0}}$ of the radius of the ramified macromolecule versus the square $\overline{r^2_0}$ of the radius of the nonramified one, ψ_1 denotes the mixing entropy, Θ is the temperature at which the free energy of polymer - solvent mixing is equal to the free energy of formation of an ideal solution. At $T = \Theta$, consequently, the free energy of interaction of the segments of the polymer chain with one another and with the molecules of the solvent is vanishing. For linear chains and $T = \Theta$ the function $[\eta]^{2/3}/M^{1/3} = f(M/[\eta])$ is a straight line which is parallel to the axis of abscissas. This function has to be a curve in ramified molecules. The value for g can be determined directly from the intrinsic viscosity: $g = [\eta]^{2/3}/M^{1/3}K^{2/3}$ (3). This assumption was checked by means of butadiene rubbers, prepared in the gaseous phase at 0°, 40°, and 60°C with potassium as a catalyst: CKB-0 (SKV-0), CKB-40 (SKV-40), and CKB-60 (SKV-60). Fractions with different molecular weights were obtained through precipitation by methanol. The molecular weights were determined by osmosis. Methyl ethyl ketone was used at 42°C as an ideal solvent. Θ was determined from function $T = \Theta(1 - b/M^{1/2})$ (4). T_m is the critical temperature for

the complete mixing of the polymer with the solvent. Here, $b = (V_1/\overline{v})^{1/2}\psi_1$, V_1 being the molecular volume of the solvent, $\overline{v}$ the specific volume of the polymer. The diagram $[\eta]^{2/3}M^{1/3} = f(M/[\eta])$ (Fig. 2) was set up on the basis of the measured $[\eta]$ and M:

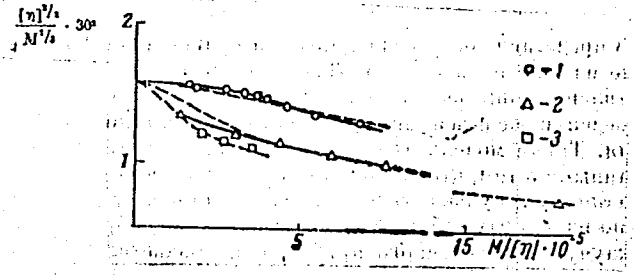

Fig. 2: The function $[\eta]^{2/3}M^{1/3} = f(M/[\eta])$ 1=SKV-0, 2 = SKV-40, 3 = SKV-60.

A sample prepared at 0°C already has ramifications in the molecule. The g calculated by equation (3), the number of nodes per molecule and the density ρ of ramification are indicated in Table 3:

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A Study of the Ramification of Butadiene Rubbers

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Образец 1	Номер фракции 2	Молекулярный вес 3	$g[\eta]$	g	Число узлов на молекулу 4	Плотность разветвления $\rho \cdot 10^5$ 5
СКВ-0	2a	980 000	0,822	0,663	6,0	0,33
	1	720 000	0,847	0,700	4,7	0,36
	3	578 000	0,898	0,783	2,9	0,27
	4	480 000	0,924	0,830	2,1	0,24
	5	410 000	0,937	0,855	1,7	0,22
	7	348 000	0,950	0,883	1,3	0,21
	8	269 000	0,962	0,907	1,05	0,21
	11a	117 000	0,968	0,925	0,75	0,34
	9	95 000	0,982	0,955	0,45	0,26
СКВ-40	4	1 280 000	0,472	0,300	58,0	2,44
	5	543 000	0,626	0,436	22,0	2,17
	6	420 000	0,675	0,485	16,1	2,09
	7	292 000	0,733	0,550	11,6	2,13
	8	184 000	0,765	0,588	9,3	2,70
	9	44 000	0,848	0,700	4,7	5,90
СКВ-60	6	182 000	0,708	0,520	13,5	4,0
	7	108 000	0,740	0,558	11,2	5,6
	8	70 000	0,778	0,605	8,5	6,7

Table 3: 1 = sample, 2 = No. of fraction, 3 = molecular weight, 4 = number of nodes per molecule, 5 = density of ramification.

With a rise in the temperature of polymer production, ramification also increases. The fairly constant values of fractions with molecular weight prove that fractionation has taken place only according to the molecular weight, not according to the degree of ramification. The difference ΔE of the activation energies for growth and

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A Study of the Ramification of Butadiene Rubbers

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ramification of the chain was estimated. Depending on the degree of approximation, the authors found for $\Delta E \approx 5000$ cal/mole and 13,000 cal/mole. Another result was the dependence of ramification not only on ΔE, but also on the solubility in the polymer at different temperatures. This was determined by means of an apparatus devised by G. F. Lisochkin and F. D. Belostotskaya. It was further found that the ratio of $[\eta]$ for fractions with equal molecular weight does not vary in good solvents (benzene), and, therefore, that the ideal solvent need not be applied. The authors mention V. N. Tsvetkov, O. B. Ptitsyn, A. D. Abkin, and S. S. Medvedev. There are 4 figures, 4 tables, and 24 references: 8 Soviet, 15 US, and 1 Swiss.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka im. S. V. Lebedeva (All-Union Scientific Research Institute of Synthetic Rubber imeni S. V. Lebedev)

SUBMITTED: April 21, 1960

Card 5/5

S/138/60/000/009/002/012
A051/A029

15.9205 2109,2209

AUTHORS: Poddubnyy, I.Ya.; Kartsev, V.N.; Aver'yanov, S.B.; Trenke, Yu.V.; Aver'yanova, L.A.; Yevdokimov, V.F.

TITLE: The Vulcanization of Polydimethylsiloxane Rubber Using γ-Radiation

PERIODICAL: Kauchuk i Rezina, 1960, No. 9, pp. 5 - 15

TEXT: Vulcanizates produced by the ionizing radiation method were found to have improved properties, since the formation of transverse bonds at relatively low temperatures can be accomplished without the use of chemical vulcanizing agents (Ref. 1 - 6). The vulcanization process of polydimethylsiloxanes is accomplished according to the free-radical mechanism (Refs. 1,4,7,8,2,5,6,10, 11 - 14). The results are cited of experimental work conducted in order to increase the temperature-stability of polymethylsiloxane СКТ (SKT)-based vulcanizates and to improve their physico-mechanical properties by using the radiation method of vulcanization combined with a change in the preparation of the rubber mixture and by introducing new components into the rubber composition. Co^{60} with an activity of 1,450g -equ. of radium was used as the source of the gamma-emmision. The dose was 0.28 - 0.72 Mr/h. It is pointed out that the characteristic feature of radiation vulcaniza-

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The Vulcanization of Polydimethylsiloxane Rubber Using γ-Radiation

tion appears to be the absorption energy by the filler, the possibility of further redistribution of the energy by the polymer and the filler and the formation of a chemical bond between them. Rubbers with satisfactory tensile and elastic properties could be obtained by the radiation vulcanization of SKT in combination with the introduction of various additives into the rubber mix containing γ-333 (U-333) powdered silica gel after a lengthy period of thermal aging at 300°C. These rubbers were found to exceed vulcanizates and those obtained earlier by the radiation method in their thermal resistance. By further refining the rubber mixture increases in the thermal resistance could be achieved. Radiation vulcanizates of polymethylsiloxane rubber filled with furnace carbon black could be produced with relatively high physico-mechanical properties and an elevated thermal resistance. The vulcanizates were current-conducting. Radiation vulcanizates of polymethylsiloxane rubber filled with powdered silica gel and furnace carbon blacks are much superior to the peroxide vulcanizates in their temperature stability. At a temperature of 200°C radiation vulcanizates of SKT rubber were obtained with considerably high physico-mechanical properties. The tensile properties of radiation vulcanizates filled with U-333 powdered silica gel could be considerably increased by introducing iron oxides or zirconium oxides into the rubber mix-

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The Vulcanization of Polymethylsiloxane Rubber Using γ-Radiation

ture, as well as by preliminary refining of the rubber mixtures increasing their homogeneity. They surpass the corresponding peroxide vulcanizates in their thermal resistance in closed systems at an elevated pressure and are characterized by their higher values of elasticity restoration after various periods of thermal aging, by their lower values of residual compression deformation at 150-200°C, by a lower weight loss during thermal aging and a somewhat higher frost-resistance. They do not differ from the peroxide vulcanizates in their dielectric properties, hardness, elasticity and tear-resistance. The authors recommend their method for the production of highly heat-resistant radiation vulcanizates of polymethylsiloxane rubber in the manufacture of articles intended for use under conditions of long-lasting temperature effect of up to 300°C. There are 9 tables, 5 figures and 16 references: 4 Soviet, 11 English, 1 German.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka im. S.V. Lebedev (All-Union Scientific Research Institute of Synthetic Rubber im. S.V. Lebedev)

Card 3/3

BRESLER, S.Ye.; MOSEVITSKIY, M.I.; PODDUBNYY, I.Ya.; SHI GUAN-I

Characteristics of the mechanism underlying the termination of molecular chains in the process of polymerization under the influence of complex catalysts. Dokl.AN SSSR 134 no.1:117-120 S '60. (MIRA 13:8)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka im. S.V.Lebedeva i Institut vysokomolekulyarnykh soyedineniy Akademii nauk SSSR. Predstavleno akad. V.G.Karginym.
(Polymerization)

PODUBNYY, I. Ya.

PRIKHOT'KO, A.F.

24(7) p.3 PHASE I BOOK EXPLOITATION SOV/1365

L'vov. Universytet

Materialy X Vsesoyuznogo soveshchaniya po spektroskopii. t. 1: Molekulyarnaya spektroskopiya (Papers of the 10th All-Union Conference on Spectroscopy. Vol. 1: Molecular Spectroscopy) [L'vov] Izd-vo L'vovskogo univ-ta, 1957. 499 p. 4,000 copies printed. (Series: Its: Fizychnyy zbirnyk, vyp. 3/8/)

Additional Sponsoring Agency: Akademiya nauk SSSR. Komissiya po spektroskopii. Ed.: Gazer, S.L.; Tech. Ed.: Saranyuk, T.V.; Editorial Board: Landsberg, G.S., Academician (Resp. Ed., Deceased), Neporent, B.S., Doctor of Physical and Mathematical Sciences, Fabelinskiy, I.L., Doctor of Physical and Mathematical Sciences, Fabrikant, V.A., Doctor of Physical and Mathematical Sciences, Kornitskiy, V.G., Candidate of Technical Sciences, Rayskiy, S.M., Candidate of Physical and Mathematical Sciences, Klimovskiy, L.K., Candidate of Physical and Mathematical Sciences, Miliyanchuk, V.S., Candidate of Physical and Mathematical Sciences, and Glauberman, A. Ye., Candidate of Physical and Mathematical Sciences.

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Card 27/30

PODDUBNYY, L.Ya.; EHRENBURG, Ye.G.

Branching of butadiene rubbers. Vysokom. soed. 2 no. 11:1625-1634 N '60. (MIRA 13:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut sinteticheskogo kauchuka imeni S.V. Lebedeva.
(Rubber, Synthetic)

MIROVICH, O.L.; PODDUBNYY, N.M.

Repairing equipment for electric contact welding. Stroi. truboprov. 9 no.4:19 Ap '64. (MIRA 17:9)

1. Trest Yuzhgazprovodstroy, Rostov-na-Donu.

KAURICHEV, I.S.; NEPOMILUYEV, V.F.; PODDUBNYY, N.N.

Characteristics of oxidation-reduction processes in Solonetz and Soloth soils [with summary in English]. Pochvovedenie no.4:9-15 Ap '59. (MIRA 12:7)

1. Sel'skokhozyaystvennaya akademiya im. K.A. Timiryazeva.
(Solonetz soils) (Soloth soils) (Oxidation-reduction reaction)

PODDUBNYY, N.N., kand.sel'skokhozyaystvennykh nauk; NEPOMILUYEV, V.F., kand.biologicheskikh nauk

Properties of solodized soils and their biochemical processes under excessively wet conditions. Izv. TSKhA no.3:98-108 '60. (MIRA 14:4)

(Solonetz soils) (Soloth soils) (Soil micro-organisms)

USSR/Soil Science - Physical and Chemical Properties of Soil. J-3

Abs Jour : Ref Zhur - Biol., No 5, 1958, 20053

Author : Poddubnyy, N.N.
Inst : -
Title : Physical Property Changes in Virgin Chernozem Soils of Kokchetavskaya Oblast' During Their Appropriation.

Orig Pub : Dokl. Mosk. s.-kh. akad. im. K.A. Timiryazeva, 1956, 1, No 26, 37-42

Abstract : The uninterrupted use of the chernozem soils for grain crops at the Kellerovkiy Auxiliary Site for 5 straight years caused a marked worsening in the soil structure. The effect of different methods of working the soil was tried out on the condition of soil structure. Non-terracing plowing in comparison with other methods of tilling brought about less disruption of the water proof aggregates larger than 0.25 mm. The greatest moisture in the soil horizons was also observed with non-terraced plowing.

Card 1/2

MOTORINA, L.V., aspirantka; PODDUBNYY, N.N., kand.sel'skokhozyaystvennykh nauk; ANIKINA, Ye.A.

Relation between vegetation and soils; based on investigations in floodlands of the Oka River in Stupino District, Moscow Province. Izv. TSKhA no.3:202-206 '61. (MIRA 14:9)
(Alluvial lands) (Oka Valley--Botany)

USSR/Soil Science. Soil Biology J-2

Abs Jour : Ref Zhur - Biol., No 10, 1958, No 43803

Author : Poddubnyy N.N., Nepomiluyev V.F.
Inst : Not Given
Title : The Biochemical Processes Occurring in Solonetz and Soloth Soils in the Presence of Excessive Moisture

Orig Pub : Dokl. Mosk. s.-kh. akad. im. K.A. Timiryazeva, 1957, vyp., 29, 202-207

Abstract : Research made in Kokchetavskaya and Saratovskaya Oblasts has shown that excessive moisture in solonetz and soloth soils reduces the quantity of aerobic saprophitic microorganisms, the nitrifying and aerobic cellulose-decomposing bacteria, while increasing the amount of anaerobic microorganisms. Under anaerobic conditions the microbiological processes lead to the formation of ferrous compounds. The intensity of these processes depends on the composition of organic substances, as well as on the quantity of diverse species of microorganisms. F.N. Sofiyeva

Card : 1/1

PODDUBNYY, V.N., asistent, kand. nauk; NEPOMILUYEV, V.F., assistent, kand. nauk.

Biochemical processes in Solonetz and Soloth soils with excessive moisture. Dokl. TSKhA no.29:202-207 '57. (MIRA 11:8)
(Solonetz soils) (Soloth soils)

Poddubnyy Poddubniy, N. N.

USSR/Soil Science. Physical and Chemical Properties of Soils. I-2

Abs Jour: Referat.Zh.Biol., No. 16, 25 Aug, 1957, 69004

Author : Kaurichev, I.S., Poddubniy, N. N.
Inst :
Title : Water Regimen of Normal and Lixiviated Black Soils of the Right Bank in Saratov Province.

Orig Pub: Dokl. Mosk. s.-kh. akad. im. K.A. Timiryazeva, 1956, No. 23, 177-184

Abstract: Results of tests are described from the educational-experimental farm TSKhA "Mummovskoe" on black soils of the Don slope of the Prevolga elevation. Fixed observations were conducted monthly during vegetative periods of 1953-1954 under perennial and annual grasses and different agricultural products.

Card 1/1

PODDUBNYY, N. N.

KAURICHEV, I.S., kandidat sel'skokhozyaystvennykh nauk; PODDUBNYY, N.N., kandidat sel'skokhozyaystvennykh nauk.

Soils of the "Mummovskoe" Training Farm and their agronomic characteristics. Izv.TSKhA no.2:141-155 '57. (MLRA 10:9)
(Atkarsk District--Soils)

J

USSR/Soil Science - Soil Genesis and Geography.

Abs Jour : Ref Zhur Biol., No 19, 1958, 86714

Author : Poddubnyy, N.N.

Inst : Moscow Agric. Acad. im. K.A. Timiryazev

Title : Salinity of Soils of Kellerovskiy Rayon of Kokchetavskaya Oblast

Orig Pub : Dokl. Mosk. s.-kh. akad. im. K.A. Timiryazeva, 1957, vyp. 31, 241-246

Abstract : Ordinary average and thin chernozems are most prevalent in the territory of Kellerovskiy Rayon. The bottom part of the soil profile is saline. At a 15-meter depth in these soils, the content of water-soluble salts even reaches 0.8%. The chlorides, sulfates and bicarbonates of Na, K, Ca predominate. The content of exchangeable Na is from 5 - 10 to 15 - 17%, of Mg from 11 - 13 to 30 - 40% of the

Card 1/2

PODUBNYY, N.N.

YARKOV, S.P., doktor sel'skokhozyaystvennykh nauk, professor [deceased];
KAURICHEV, I.S., kandidat sel'skokhozyaystvennykh nauk, dotsent;
PODUBNYY, N.N., kandidat sel'skokhozyaystvennykh nauk.

Studying the genesis of Solonetz and Soloth soils. Izv. TSKhA no.2:141-150 '56. (MLRA 9:12)

(Solonetz soils) (Soloth soils)

PODDUBNYY, N.N.

"Soils of the Left-Bank Portions of Atkarskiy Rayon of Saratovskaya Oblast and Their Agronomical Characteristics." Cand Agr Sci, Moscow Order of Lenin Agricultural Acad imeni K. A. Timiryazev, Moscow, 1955. (KL, No 14, Apr 55)

SO: Sum. No. 704, 2 Nov 55 - Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (16).

KULAKOV, Ye.V.; MERSHIN, A.P.; PANOV, I.P.; PODDUBNYY, N.N.; ZENIN, A.A.; KOPTEVA, Z.F.

Fertility of virgin and waste lands. Zemledelie 4 no.10:28-36 O '56. (MLRA 9:11)
(Soil fertility)

PODDUBNYY, N.P.

Characteristics of the distribution of rubidium in the granitoids and dikes of the Kugitang massif (southwestern spurs of the Gissar Range). Uzb. geol. zhur. 9 no.5:44-50 '65.
(MIRA 18:11)

1. Institut geologii i geofiziki im. Kh.M. Abdullayeva AN UzSSR. Submitted March 2, 1965.

GNUSIN, N.P.; PODDUBNYY, N.P.; FEL'DE, U.G.

Valve effect for a metal immersed in a solution of its ions in the presence of a chemical and concentration polarization. Izv. SO AN SSSR no.3 Ser. khim. nauk no.1:117-120 '65. (MIRA 18:8)

1. Institut fiziko-khimicheskikh osnov pererabotki mineral'nogo syr'ya Sibirskogo otdeleniya AN SSSR, Novosibirsk.

GNUSIN, N.P.; PODDUBNYY, N.P.; RUDENKO, E.N.; FOMIN, A.G.

Current distribution on a cathode as a strip in a half-space of the electrolyte with a polarization curve expressed by the Tafel formula. Elektrokhimiia 1 no.4:452-459 Ap '65.
(MIRA 18:6)

1. Khimiko-metallurgicheskiy institut Sibirskogo otdeleniya AN SSSR.

PODDUBNYY, P.

Change in the design of packingfor compressor shafts. Avt.transp. 33 no.6:34 Je '55. (MLRA 8:10)
(Automobiles--Engines--Superchargers)

Poddubnyy, S.

L 45811-65 EWT(1)/EWG(v) Po-4/Pe-5/Pq-4/Pg-4 GW S/ 36 B41
ACCESSION NR AM4047285 BOOK EXPLOITATION

Vasil'yeva, Inna Leonidovna; Vereda, Sergey Vasil'yevich; Gracheva, N. P.; Lyubimov, L. M.; Naumenko-Bondarenko, I. I.; Poddubnyy, S. A.; Abel'skiy, N. IE.

Devices, repair, maintenance and operation of gravimetric apparatus (Ustroystvo, naladka, remont i ekspluatatsiya gravimetricheskoy apparatury), Moscow, Izd-vo "Nedra", 1964, 223 p. illus., biblio.

TOPIC TAGS: gravimetric equipment, geophysics, gravimetry

PURPOSE AND COVERAGE: This book describes the principles of tuning, regulation and error elimination of gravimetric equipment used in gravimetric exploration and other gravimetric work in the Soviet Union: quartz ground and bottom gravimeters, gradientometers, variometers, and densitometers. In addition, it describes the equipment of a quartz shop and methods of making and repairing the quartz system of quartz astatic gravimeters. The book is intended for engineers and technicians concerned with field gravimetry. It will be useful to students studying geophysics.

TABLE OF CONTENTS [abridged]:

Card 1/2

L 45811-65

ACCESSION NR AM4047285

SUBMITTED: 09Mar64 SUB CODE: ES, EC

NO REF SOV: 019 OTHER: 001

Card 2/2

PODDUBNYY, S.A.

LYUBIMOV, L.M.; PODDUBNYY, S.A.; SAMSONOV, N.N.; AREST, V.I., redaktor.

[Manual of instructions on gravimetric prospecting with gravimeters] Instruktsiia po gravirazvedke s gravimetrami. Utverzhdena E.T.Shatalovym 24 iiulia 1952 g. Moskva, Gos. izd-vo geol. lit-ry, 1952. 72 p. (MLRA 7:4)

1. Russia (1923- U.S.S.R.) Ministerstvo geologii.
(Prospecting--Geophysical methods)

40221
S/169/62/000/007/047/149
D228/D307

9.6160

AUTHOR: Poddubnyy, S. A.

TITLE: ГРБМ-2 (GRBM-2) gravity gradientometer

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 7, 1962, 26-27, abstract 7A175 (V sb. Sostoyaniye i perspektivy ratviтiya geofiz. metodov poiskov i razvedki polezn. iskopayemykh, M., Gostoptekhizdat, 1961, 419-423)

TEXT: The quick-acting GRBM-2 gravity gradientometer contains an Eotvos torsion balance, though this has a very small lever arm. Thanks to the presence of extremely strongdamping, the instrument's torsion systems are damped in the equilibrium position in 2 - 3 min. The gradientometer measures only the horizontal gravity components U_{xz} and U_{yz}. The gradientometer's accuracy is ± 5 eotvos units. Its productivity exceeds that for variometer surveying by 5- to 7-fold. A leveling set, which allows the productivity of work on allowing for the topography to be increased by 6 - 8 times, was developed at the same time as the GRBM-2 gradientometer. The

Card 1/2

GRBM-2 gravity gradientometer

S/169/62/000/007/047/149
D228/D307

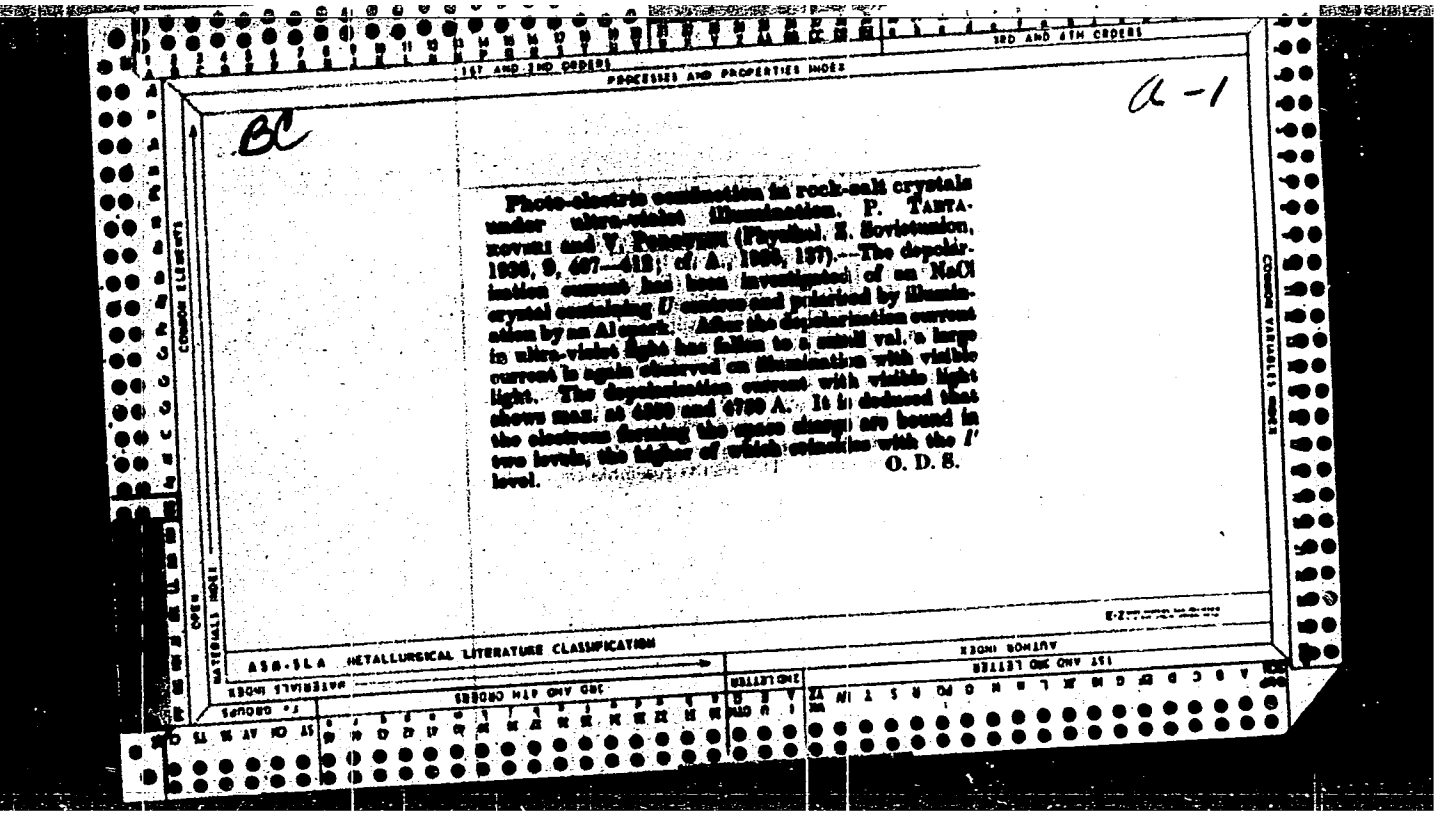
leveling set is included in the GRBM-2 gradientometer's outfit and consists of a self-adjusting dioptic level, a Samsonov rod converted to the height of the GRBM-2 instrument, and a cord with sprocket wheel radius marks. The prospects for further improving the gravity gradientometer are stated. [Abstracter's note: Complete translation.]

Card 2/2

PODDUBNYY, S.F., master-vzryvnik

Shortcommings in electric drills. Bezop.truda v prom. 5 no.7:32 Jl '61. (MIRA 14:6)

1. Shakhta No. 16 im. "Izvestiy," Luganskaya oblast'.
(Coal mining machinery)

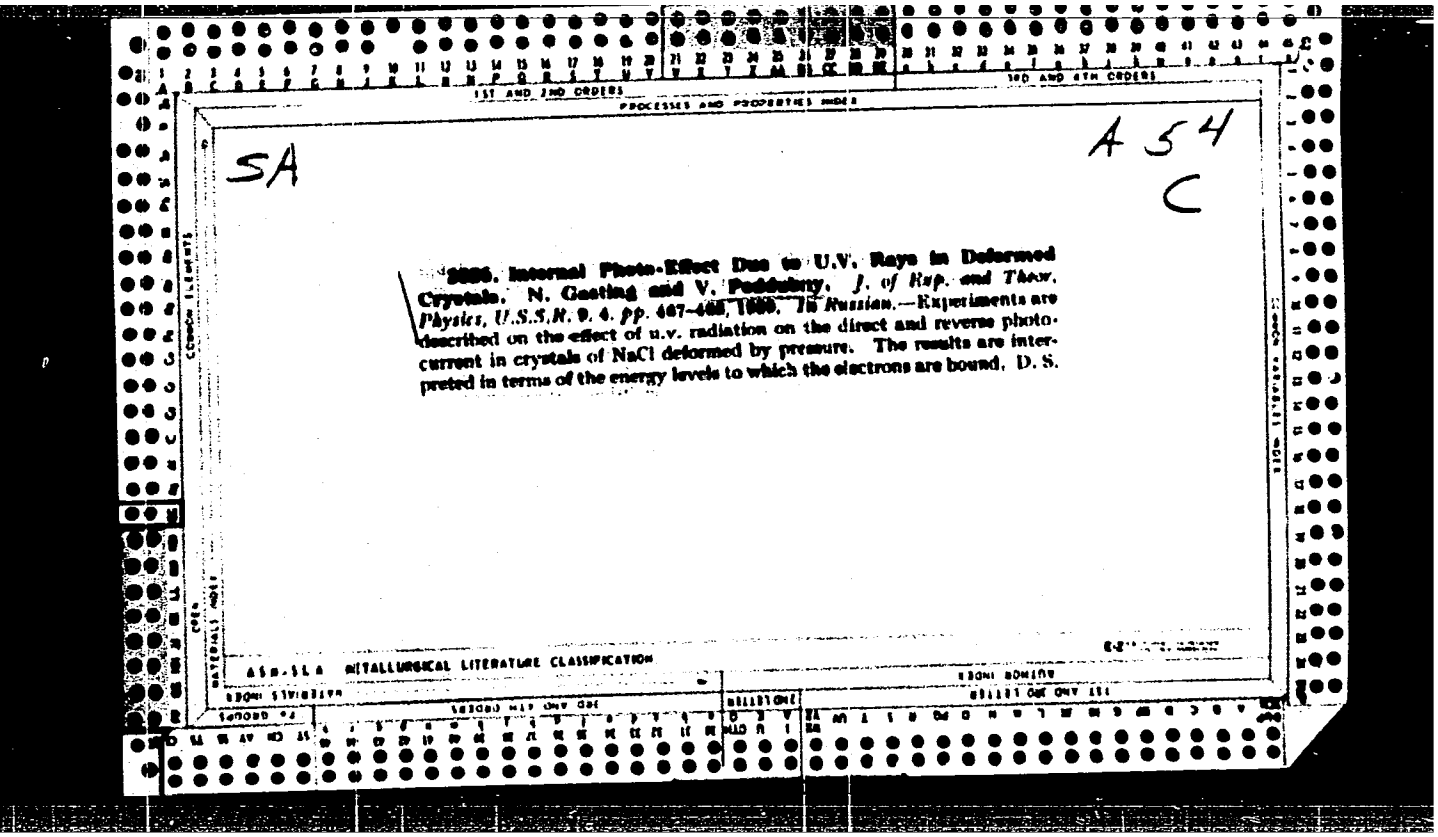


BC

a-1

Photo-electric combination in rock-salt crystals under ultra-violet illumination. P. TARTAKOVSKII and V. FOMENKO (Physikal. Z. Sowjetunion, 1936, 9, 497—513; cf. A., 1936, 157).—The depolarisation current has been investigated of an NaCl crystal containing *U* centres and polarised by illumination by an Al spark. After the depolarisation current in ultra-violet light has fallen to a small val. a large current is again observed on illumination with visible light. The depolarisation current with visible light shows max. at 4800 and 4780 A. It is deduced that the electrons forming the space charge are bound in two levels, the higher of which coincides with the *F'* level.

O. D. S.



5A

A 54
C

2886. Internal Photo-Effect Due to U.V. Rays in Deformed Crystals. N. Gasting and V. Paddubny. *J. of Exp. and Theor. Physics, U.S.S.R.* 9. 4. *pp.* 467–468, 1939. *In Russian.*—Experiments are described on the effect of u.v. radiation on the direct and reverse photo-current in crystals of NaCl deformed by pressure. The results are interpreted in terms of the energy levels to which the electrons are bound. D. S.

MALEVANAYA, S., inzh.; PODDUBNYY, V., inzh.

New developments in the mechanization of underground haulage.
Mast.ugl. 8 no.3:14-15 Mr '59. (MIRA 13:4)

1. Kuznetskiy nauchno-issledovatel'skiy ugol'nyy institut.
(Kuznetsk Basin--Mine haulage)

MELEVANAYA, S.V.; PODDUBNYY, V.I.; MAKSIMOV, V.I.; SUKHOZAD, G.A.; VOLOSHIN, N., red.; RUDINA, G., tekhn. red.

[Mechanization on a small scale in Kuznetsk Basin mines] Malaia mekhanizatsiia na shakhtakh Kuzbassa. Kemerovo, Kemerovskoe knizhnoe izd-vo, 1959. 99 p. (MIRA 15:11)
(Kuznetsk Basin--Coal mines and mining)

KOLESNIKOV, G. I.; PODDUBNYY, V. I.

Chromatographic analysis of the acid composition of the products of oxidation of furfurol in the gas phase. Izv. vys. ucheb. zav.; pishch. tekh. no.5:40-42 '62. (MIRA 15:10)

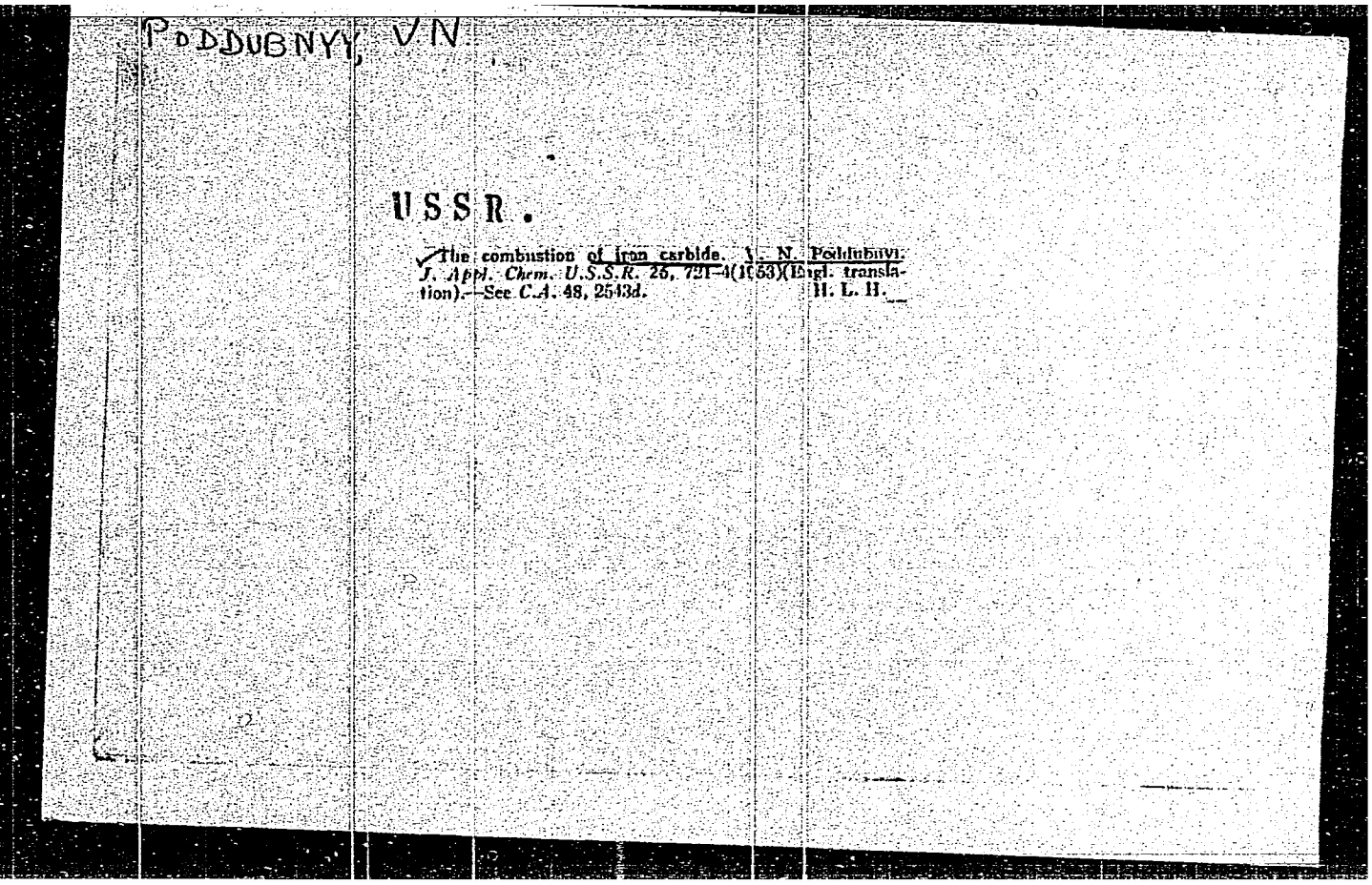
1. Krasnodarskiy institut pishchevoy promyshlennosti, kafedra tekhnologii plasticheskikh mass.

(Chromatographic analysis) (Furaldehyde)

PAVLOV, G.M.; PODDUBNYY, V.I.

Effect of the hydrogenation temperature of soybean oil on the formation of unsaturated, fatty acid position isomers. Izv.vys.ucheb. zav.;pishch.tekh. no.5:42-48 '60. (MIRA 13:12)

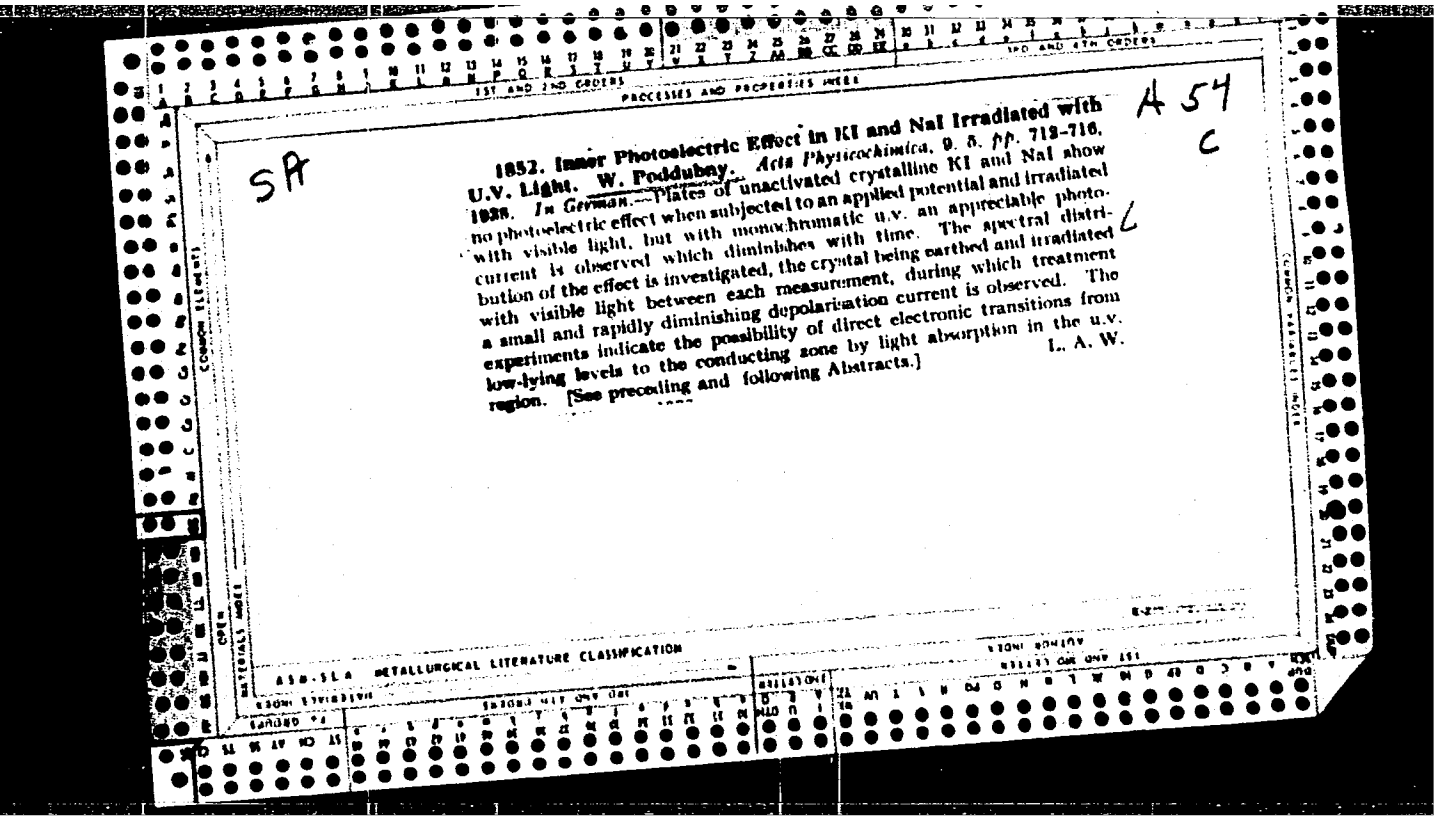
1. Krasnodarskiy institut pishchevoy promyshlennosti. Kafedra pererabotki zhirov.
(Soybean oil) (Hydrogenation) (Acids, Fatty)



PODDUBNYY, V N

USSR.

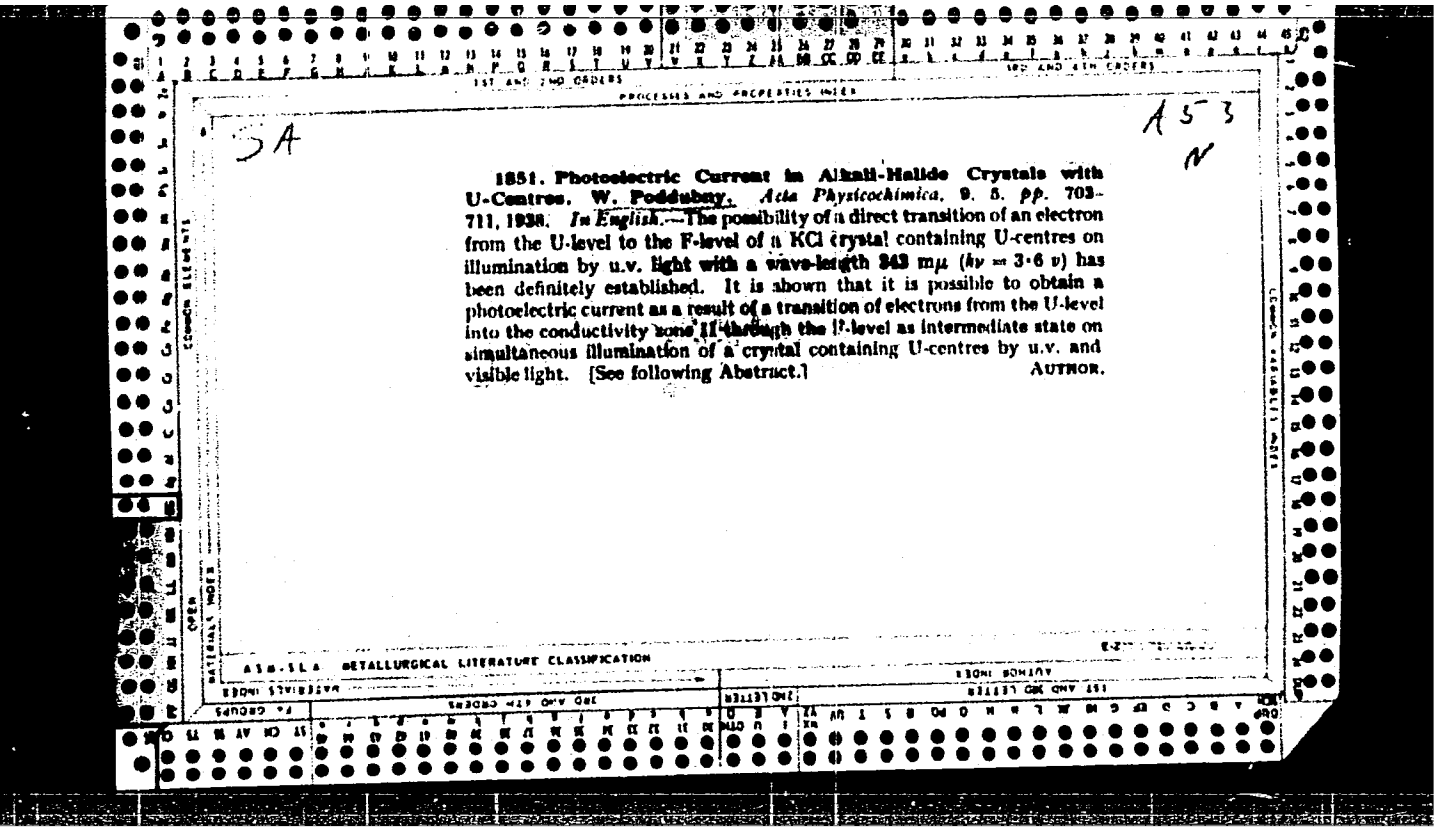
The combustion of iron carbide. V. N. Poddubnyi. *J. Appl. Chem. U.S.S.R.* 25, 721–4(1953)(Engl. translation).—See *C.A.* 48, 2543d. H. L. H.



SA

A 54
C

1852. **Inner Photoelectric Effect in KI and NaI Irradiated with U.V. Light.** W. Poddubnay. *Acta Physicochimica*, U. S. S. R., 1938. *In German.*—Plates of unactivated crystalline KI and NaI show no photoelectric effect when subjected to an applied potential and irradiated with visible light, but with monochromatic u.v. an appreciable photo-current is observed which diminishes with time. The spectral distribution of the effect is investigated, the crystal being earthed and irradiated with visible light between each measurement, during which treatment a small and rapidly diminishing depolarisation current is observed. The experiments indicate the possibility of direct electronic transitions from low-lying levels to the conducting zone by light absorption in the u.v. region. [See preceding and following Abstracts.] L. A. W.



5A

A53
N

1851. Photoelectric Current in Alkali-Halide Crystals with U-Centres. W. Poddubny. *Acta Physicochimica*, 9, 5, *pp.* 703–711, 1938. *In English.*—The possibility of a direct transition of an electron from the U-level to the F-level of a KCl crystal containing U-centres on illumination by u.v. light with a wave-length 343 mμ ($h\nu = 3{\cdot}6$ v) has been definitely established. It is shown that it is possible to obtain a photoelectric current as a result of a transition of electrons from the U-level into the conductivity zone, through the F-level as intermediate state on simultaneous illumination of a crystal containing U-centres by u.v. and visible light. [See following Abstract.] AUTHOR.

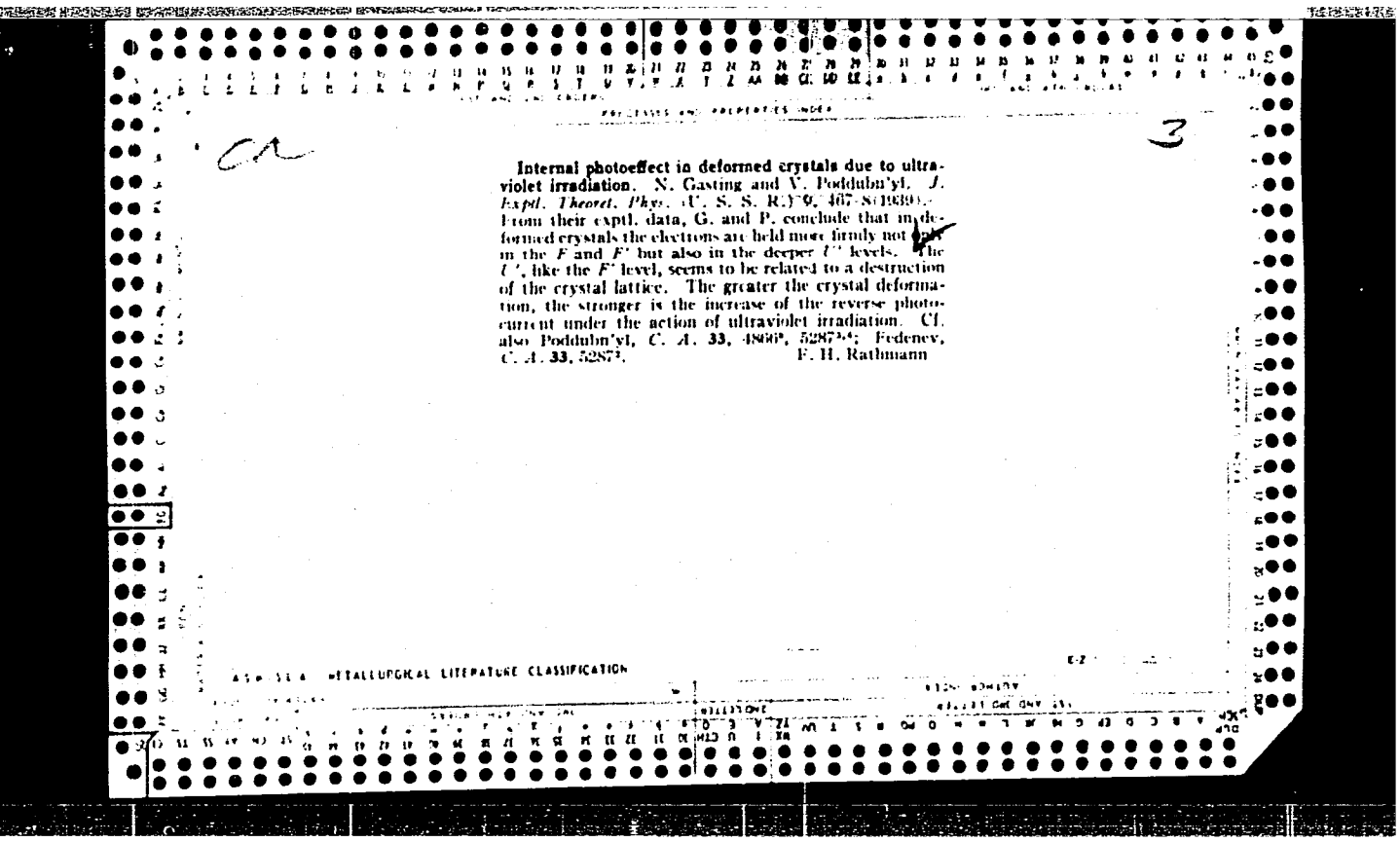
PROCESSES AND PROPERTIES INDEX

Ca

14

Some data on the hydrogeological characteristics of underground waters in the southeastern part of the Syvash-Kirov District of the Crimean A. S. S. R. I. P. Poddubnyi. *J. geol., Acad. sci. Ukrain. S. S. R.* 6, No. 3, 103-6 (in English, 100) (1939). From chem. analysis P. finds that the ground waters are chemically related to the waters of the neighboring oil fields. F. H. Rathmann

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION



Internal photoeffect in deformed crystals due to ultraviolet irradiation. N. Gasting and V. Poddubn'yi. *J. Expil. Theoret. Phys.* (U. S. S. R.) 9, 467–8 (1939).—From their expil. data, G. and P. conclude that in deformed crystals the electrons are held more firmly not only in the F and F' but also in the deeper U' levels. The U', like the F' level, seems to be related to a destruction of the crystal lattice. The greater the crystal deformation, the stronger is the increase of the reverse photocurrent under the action of ultraviolet irradiation. Cf. also Poddubn'yi, *C. A.* **33**, 4866⁸, 5287³·⁴; Fedenev, *C. A.* **33**, 5287³. F. H. Rathmann

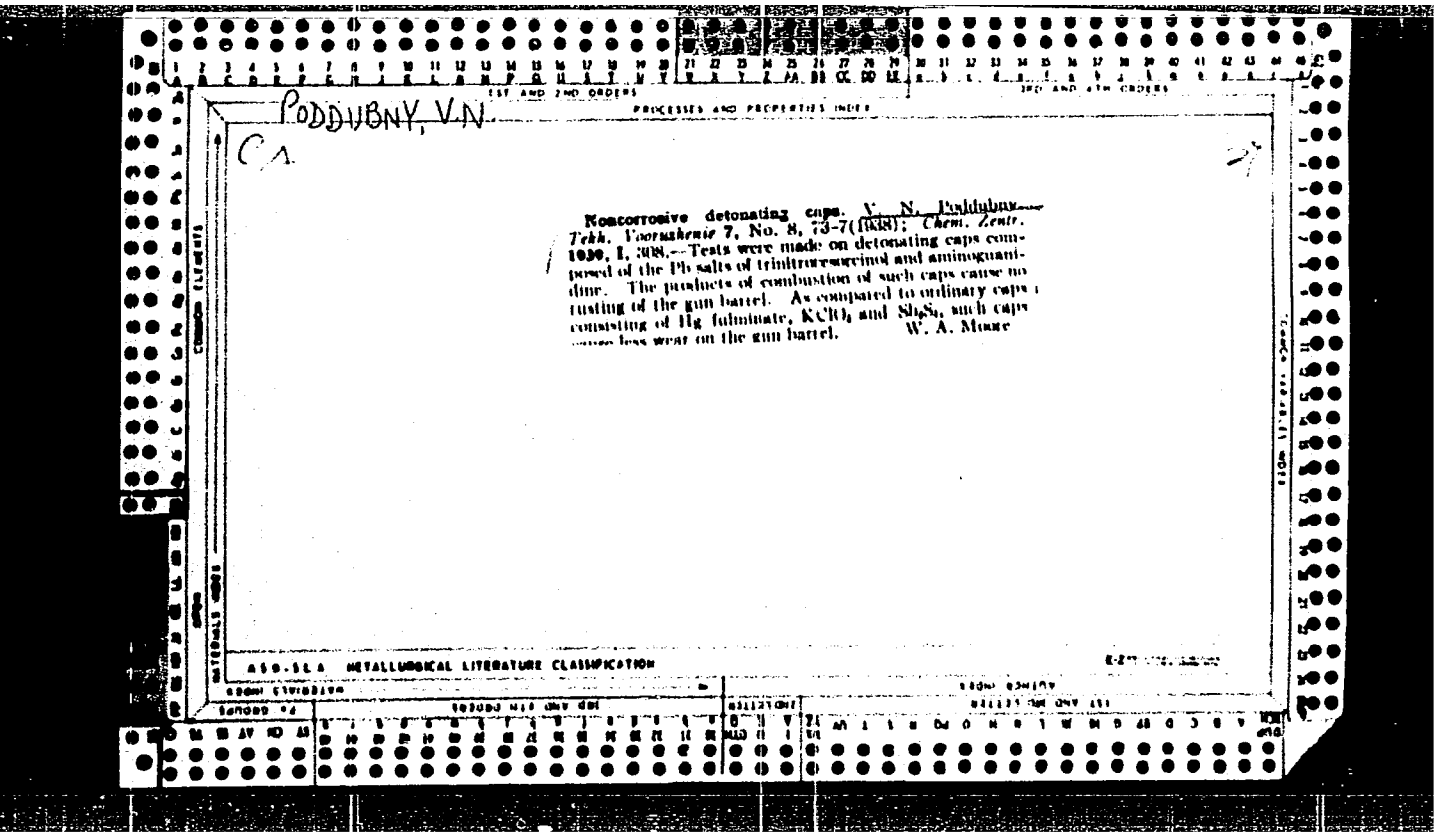
1. PODDUBNYI, V. N.

2. USSR (600)

4. Iron Ores

7. Origin of iron ores, Izv. AN SSSR. Ser. geol., no. 2, 1953.

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

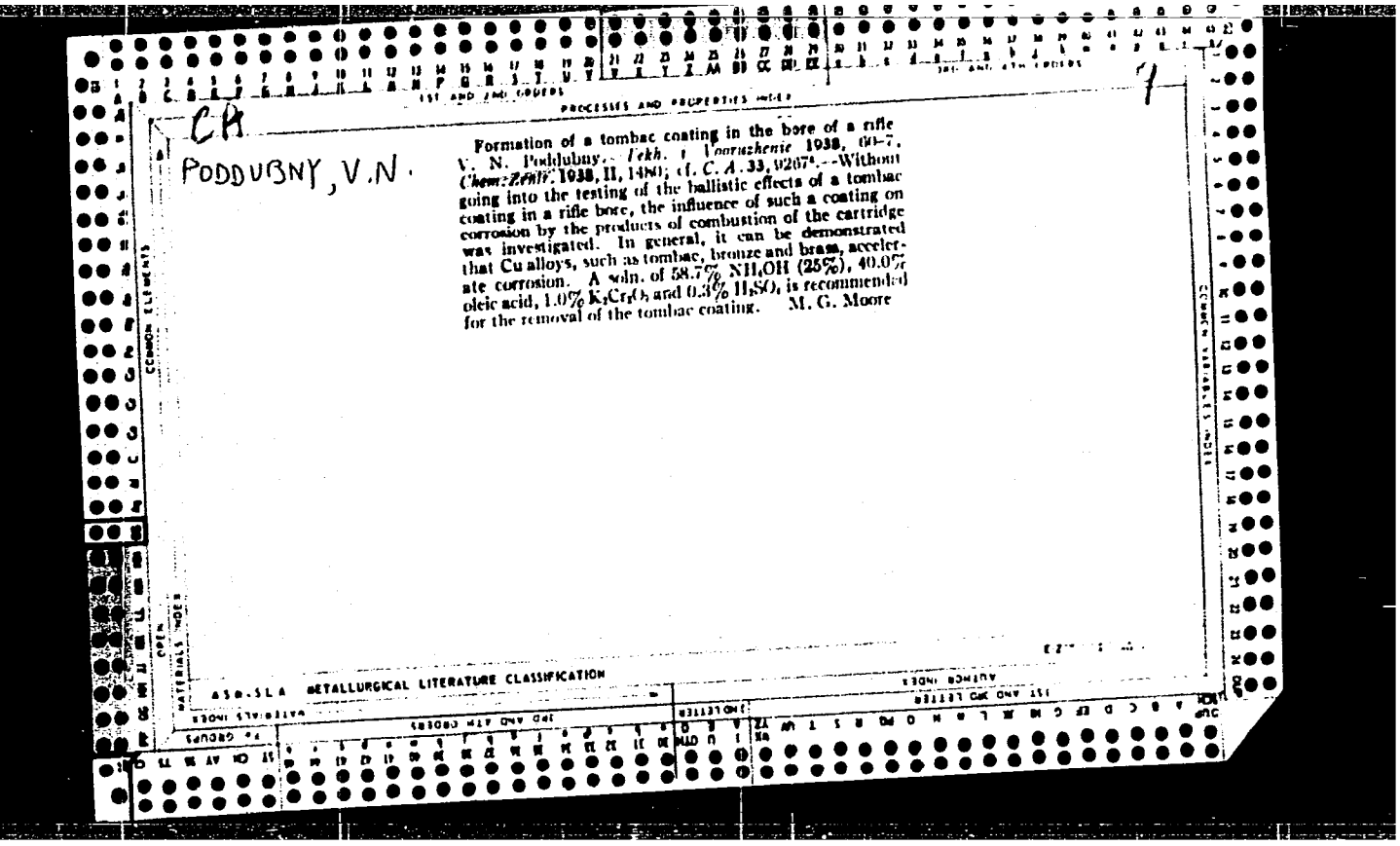


PODDUBNY, V.N.

C.A.

Noncorrosive detonating caps. V. N. Poddubny. *Tekh. Vooruzheniie* 7, No. 8, 75-7(1938); *Chem. Zentr.* 1939, I, 308.—Tests were made on detonating caps composed of the Pb salts of trinitroresorcinol and aminoguanidine. The products of combustion of such caps cause no rusting of the gun barrel. As compared to ordinary caps consisting of Hg fulminate, $KClO_3$ and Sb_2S_3, such caps cause less wear on the gun barrel. W. A. Moore

A50-SLA METALLURGICAL LITERATURE CLASSIFICATION



CA

PODDUBNY, V.N.

Formation of a tombac coating in the bore of a rifle. V. N. Poddubny. *Tekh. i Vooruzhenie* 1938, 06–7. *Chem. Zentr.* 1938, II, 1480; cf. *C. A.* 33, 9267⁸.—Without going into the testing of the ballistic effects of a tombac coating in a rifle bore, the influence of such a coating on corrosion by the products of combustion of the cartridge was investigated. In general, it can be demonstrated that Cu alloys, such as tombac, bronze and brass, accelerate corrosion. A soln. of 58.7% NH_4OH (25%), 40.0% oleic acid, 1.0% $K_2Cr_2O_7$ and 0.3% H_2SO_4 is recommended for the removal of the tombac coating. M. G. Moore

Poddubnyy, V.

PODDUBNYY, V., Engr-Col, Stalin Prize Winner, Candidate of Technical Sciences

Listed as author of article, "A New Winter Lubricant for Small Arms," which appeared in Voyennyy Vestnik, No 11, 1955. (VV, No 12, 1955)

(Note: FDD Summary 880 incorrectly reported this article as having appeared in Voyennyy Vestnik No 10, 1955.)

D

2000

2(7); 5(2) PHASE I BOOK EXPLOITATION SOV/2954

Poddubnyy, Vadim Nikolayevich, Engineer, Colonel, Laureate of the Stalin Prize, Candidate of Technical Sciences

Korroziya oruzhiya i boyepripasov (Corrosion of Arms and Ammunition) 2nd ed., rev. and enl. Moscow, Voyenizdat, 1959. 350 p.

Ed.: A.N. Maryshev; Tech. Ed.: M.A. Strel'nikova.

PURPOSE: This book is intended for military engineers, technicians, and artillery officers of the Soviet Armed Forces.

COVERAGE: This book explains the theoretical principles of metal corrosion of artillery equipment, both during manufacture and in the field. Equipment discussed includes mounted guns, small arms, and munitions. Methods are suggested for combating corrosion and for the application of protective coating. The various paints, lubricants, and fluids used in storing, repairing, and operation of artillery equipment in the Soviet Armed Forces are described. The author cites the works of Professor G. V. Akimov, Corresponding Member of the USSR Academy of Sciences, N.D. Tomashov, Doctor of Technical Sciences, and

Card 1/8

Corrosion of Arms and Ammunition SOV/2954

Professor I.L. Rozenfel'd. No references are given.

TABLE OF CONTENTS:

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L 2939-66 EWT(m)/EPF(c)/EWP(j)/T/EWP(t)/EWP(b) JD/WW/WB/RM

ACCESSION NR: AP5024386 UR/0286/65/000/015/0068/0068
620.197.3

AUTHOR: Shekhter, Yu. N.; Vaynshtok, V. V.; Dol'berg, A. L.; Kalashnikov, V. P.; Poddubnyy, V. N.; Goryacheva, V. I.; Rozvadovskaya, I. N.; Levitin, M. K.

TITLE: Preparative method for corrosion inhibitors for metals. Class 23, No. 173366

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 15, 1965, 68

TOPIC TAGS: corrosion inhibitor

ABSTRACT: An Author Certificate has been issued for a preparative method for corrosion inhibitors for metals which involves petroleum product nitration. To increase the inhibitor effectiveness, to lower its cost, and to widen the range of available inhibitors, petrolatum, or oxidized petrolatum, or pyro polymers, or a mixture thereof are nitrated. [SM]

ASSOCIATION: none

SUBMITTED: 09Mar63 ENCL: 00 SUB CODE: MM
NO REF SOV: 000 OTHER: 000 ATD PRESS: 4110
Card 1/1

L 01303-67 EWT(m)/EWP(j)/EWP(t)/ETI IJP(c) JD/WB/RM

ACC NR: AP6003433 (A) SOURCE CODE: UR/0065/66/000/001/0043/0051

AUTHOR: Dol'berg, A. L.; Vaynshtok, V. V.; Kreyn, S. E.; Shekhter, Yu. N.; Poddubnyy, V. N.

ORG: none

TITLE: Production of nitrated petrolatum-base corrosion inhibitors

SOURCE: Khimiya i tekhnologiya topliv i masel, no.1, 1966, 48-51

TOPIC TAGS: petroleum product, corrosion inhibitor, steel, corrosion protection

ABSTRACT: Ozocerite and petrolatum-base corrosion inhibitors are now made by oxidation with air at 130-160C in the presence of a catalyst. The preparation takes 10-24 hr. A less time-consuming method was offered for producing a corrosion inhibitor from petrolatum. It consisted of treating petrolatum with a 62% HNO_3 solution, neutralizing the reaction product with a 20% aqueous solution of NaOH without removal of the spent HNO_3, and dehydration. The nitrated and neutralized petrolatum was completely soluble in oil and insoluble in water. The test on the corrosion-protective properties of the 5% solution of nitrated petrolatum in transformer oil made with St.45 steel proved that, as a corrosion inhibitor, the product was not inferior, if not superior, to the oxidized petrolatum. The optimal consumption of HNO_3 was determined as 10%. Nitrating petrolatum with large amounts of HNO_3 ($\geq$30%) contributed in some cases to its corrosive properties

Card 1/2 UDC: 665.521.5 : 66.095.81 : 620.193

L 01303-67

ACC NR: AP6003433

with respect to the steel. The treatment of oxidized petrolatum with small amounts (5-15%) of 62% HNO_3 with neutralization by NaOH and dehydration yielded an inhibitor soluble both in water and in oils. This permitted it to be used in the form of either oil or water solutions. The most effective corrosion inhibitors for the steel was the oxidized petrolatum, having an acid number of 30-45 after treatment with 15% addition of the 62% HNO_3 solution. The quality of the inhibitors depended greatly on the purity of the final product. For this purpose the nitrated oxidized petrolatum was purified of spent HNO_3 by settling and treated with NaOH to a neutral reaction. The product of nitration of oxidized petrolatum was tested as a corrosion inhibitor for ferrous and nonferrous metals (Al, duralumin, Cu, Pb, Sn, bronze, Mg alloys, steels, solder, cast iron, and in combinations of metal-wood and metal-rubber). In all cases it provided for long-lasting and reliable protection. The nitration of oxidized petrolatum from the Kazan NPZ was made in a pilot plant installation with 62% HNO_3 (consumption 15%) at 70-90C for 4 hr without settling out any of the spent HNO_3. The nitrated product had an acid number of 90 mg KOH. The final neutralized inhibitor had an ash content of 7.5%, an alkalinity by phenolphthalein of 1.2 mg KOH and by bromophenol blue of 65.7 mg KOH, a water content of 1.6% Dean and Stark, and good protective properties of the 5% solution in transformer oil for St.45 steel: more than 30 days in water before the appearance of corrosion nuclei. The nitrated petrolatum and the nitration of oxidized petrolatum can be made in the same simple apparatus which is used for the nitration of mineral oils. Orig. art. has: 5 tables.

SUB CODE: 11,13/ SUBM DATE: none/ ORIG REF: 006/ OTH REF: 002

Card 2/2

PODDUBNYY, Vadim Nikolayevich; ZHUKOVA, V.I., red.

[New protective oils and greases] Novye zashchitnye smazki i masla. Leningrad, 1964. 17 p. (MIRA 17:9)

PODDUBNYY, V., kand. tekhn. nauk

Greases protect weapons. Tekh. i vooruzh. no.1:62 Ja '64.
(MIRA 17:6)

PODDUBNYY, Vadim Nikolayevich; GULEVICH, I.D., red.; BUKOVSKAYA, N.A., tekhn. red.

[Protection of weapons from corrosion] Kak sberegat' vooruzhenie ot korrozii. Moskva, Voen.izd-vo M-va obor.SSSR, 1961. 71 p. (MIRA 14:12)

(Arms and armor—Corrosion)

ACC NR: AR7004285 SOURCE CODE: UR/0274/66/000/011/A007/A007

AUTHOR: Poddubnyy, V. V.

TITLE: Effect of process transformation on information content of statistics of the same volume

SOURCE: Ref. zh. Radiotekhnika i elektrosvyaz', Abs. 11A54

REF SOURCE: Sb. 2-ya Vses. konferentsiya po teorii kodir. i yeye prilozh. Sekts. 2. Ch. 1. M., b, g., 69-75

TOPIC TAGS: coding, information theory

ABSTRACT: A possibility is considered of such an irreversible transformation of realization of a random process with zero mathematical expectation which would augment the information content of a finite-dimensional sample retaining the latter's volume. The statistics (sets of sampled values) that have the same volume as the initial statistics act in a dual way: on one hand, they augment information content thanks to a concealed utilization of most of the initial realization, on the other, they reduce the information content because of the irreversibility of transformation. Cases are possible when the transformation augmenting the information content does not exist. If such transformations do exist, an optimal should be sought which while keeping the information content of the statistics constant would minimize its volume. Bibliography of 3 titles. N. S. [Translation of abstract]

SUB CODE: 09

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ACC NR: AR6023350 SOURCE CODE: UR/0271/66/000/004/B006/B006

SOURCE: Ref. zh. Avtomat telemekh i vychisl tekhn, Abs. 4B45

AUTHOR: Poddubnyy, V. V.

TITLE: On a class of variational problems reducing to integral equations

CITED SOURCE: Tr. Sibirsk. fiz.-tekhn. in-ta pri Tomskom un-te, vyp. 47, 1965, 148-154

TOPIC TAGS: integral equation, functional equation

ABSTRACT: The problem studied is that of finding extremals $y(x,v)$ of integral real functionals of form

$$I=\int_K\int_0 F[x, v; y(x, v); y_s x)]\,dv dx \ldots, \quad (1)$$

$$y_s=\int_0 y(x, v)\,dv \ldots \quad (2)$$

with the constraints

$$\Phi_v=\int_X \varphi[x, v; y(x, v); y_s(x)]\,dx=\psi(v) \quad (3)$$

and given boundary conditions. The functions F, φ and ψ are considered as given. Under the assumption that functions F and φ have continuous first partial derivatives with respect to y and y_s for any x and v, the proposed problem reduces to the problem with "fixed ends" when the following theorem is used: if the hypersurface of $y(x,v)$

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has an extremum for the integral functional (1), is a given function of y_0 on the boundary of the region $X \times \theta$, satisfies condition (3), and is not an extremal of functional Φ for any fixed v, then a function exists such that the surface of $y(x,v)$ is an extremal of the integral functional

$$H = \int_{\theta} dv \int_{X} F[x, v; y_1(x, v); y_s(x)]\, dx + \lambda(v) \cdot \Phi(v).$$

Given as an example is the information problem of determining the distribution density which will ensure a minimum amount of information on the standard deviation of a certain quantity. Bibl. has: 3 titles.

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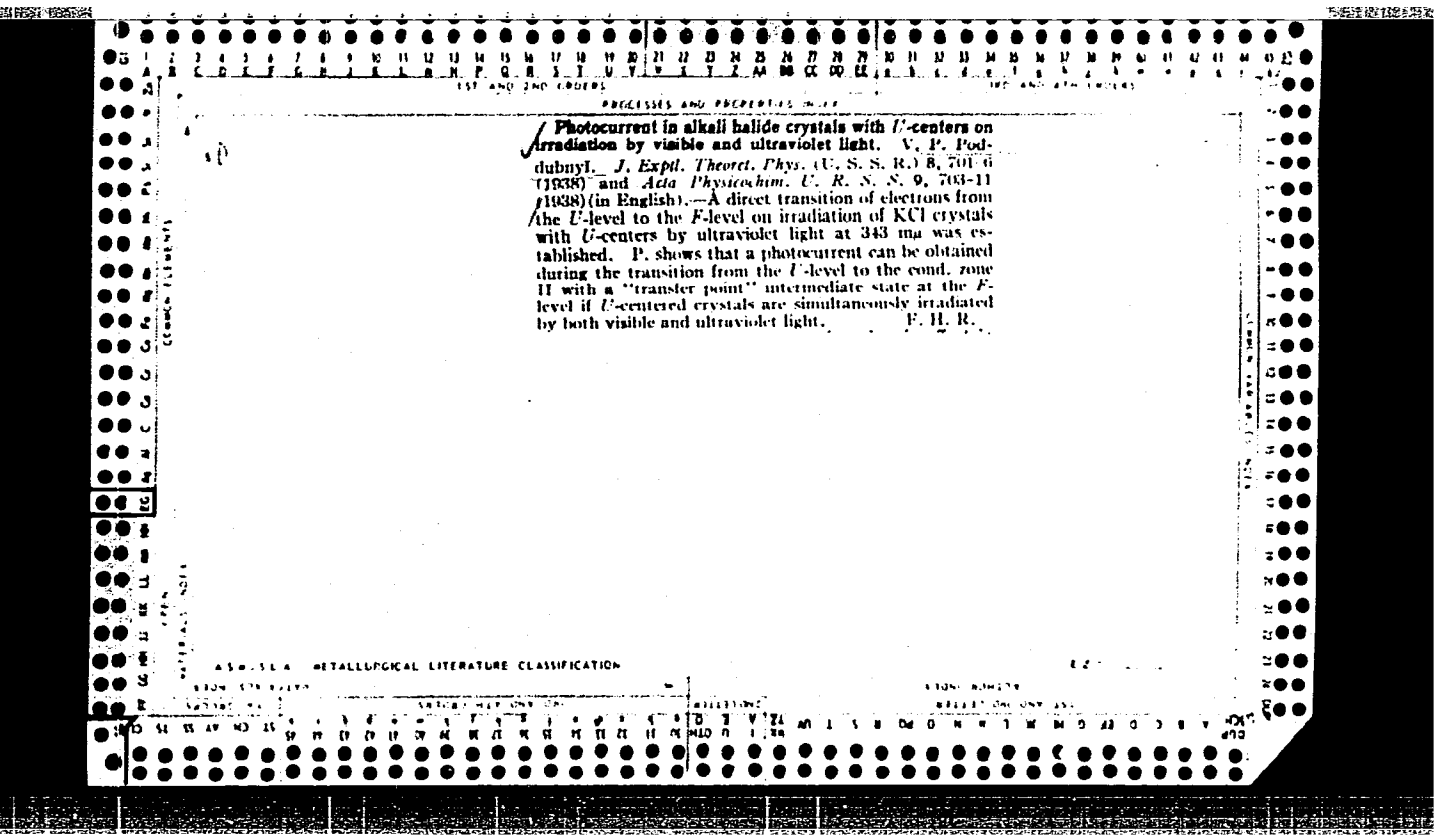

Photocurrent in alkali halide crystals with *U*-centers on irradiation by visible and ultraviolet light. V. P. Poddubnyĭ. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 8, 701–6 (1938) and *Acta Physicochim. U. R. S. S.* 9, 703–11 (1938) (in English).—A direct transition of electrons from the *U*-level to the *F*-level on irradiation of KCl crystals with *U*-centers by ultraviolet light at 343 mμ was established. P. shows that a photocurrent can be obtained during the transition from the *U*-level to the cond. zone II with a "transfer point" intermediate state at the *F*-level if *U*-centered crystals are simultaneously irradiated by both visible and ultraviolet light. F. H. R.