

PARIN, V.V.; ANTIPOV, V.V.; DAVYDOV, B.I.; PANCHENKOVA, E.F.

Study on the biological effects of certain factors in space
flight. Kosm.issl. 3 no.2:315-324 Mr-Ap '65.

(MIRA 18:4)

PARIN, V.V.; ANTIPOV, V.V.; KAUSHENBAKH, M.C.; SALSUNOV, P.I.; SHADIMOV, M.S.;
CHERNOV, G.A.

Change in the concentration of serotonin in animal blood under
the influence of ionizing radiation and the dynamic factors of
space flight. Izv. AN SSSR Ser. bio. 30 no.1:3-9 Ja-F 1965.

(MIRA 18:2)

I 4812-65 DWG(j)/DWT(m)	UR/0219/65/059/004/0073/0077
ACCESSION NR: AP5011563	21 20 B
AUTHOR: DzhiKidze, E. K.; Pekerman, S. M.; Parin, V. V.	
TITLE: Immunological reactivity in monkeys after recovery from acute radiation sickness	
SOURCE: Byulleten' eksperimental'noy biologii i meditsiny, v. 59, no. 4, 1965. 73-7	
TOPIC TAGS: immunity, radiation sickness, x-ray irradiation, antibody, phagocyte	
ABSTRACT: The natural mechanisms of immunity, particularly antibody formation, were studied in 77 monkeys 2 months to 5 years after recovery from irradiation with doses ranging from 150-700 r, from the RUM-3 and a telegamma cobalt apparatus. Antibody formation was impaired in proportion to the dose of radiation, as reflected in varying degrees of retardation or even complete inhibition of the immunological response. The humoral indices of natural immunity were not significantly affected, but the mechanisms of nonspecific cellular immunity were somewhat depressed in a number of animals during the first 10-12 months after irradiation. However, the extent of injury was not directly related to the dose. Phagocytosis returned to the original level 1-3 years later. Apparently clinical recovery was not necessar-	
Card 1/2	

L 48123-65

ACCESSION NR: AP5011563

ily accompanied by restoration of normal immunological reactivity. The mechanisms responsible for antibody formation were not repaired until 1-2 years after exposure to doses of 550-700 r. Normalization of immunobiological reactivity undoubtedly reflects the processes of restoration of all the physiological functions injured by radiation. Orig. art. has 2 figures.

ASSOCIATION: Institut eksperimental'noy patologii i terapii AMN SSSR (Institute of Experimental Pathology and Therapy, AMN SSSR)

SUBMITTED: 17Nov63

ENCL: 00

SUB CODE: LS

NO REF SOVI 003

OTHER: 005

ce
Card 2/2

S. J. C. J.

PARINA B.P.

*Synthetic Rubber and
Allied Products*

Systematization of high molecular compounds
and fundamental types of inorganic and elementary
organic polymers. A. A. BERLIN and B. P. PARINA.
Russkii Khimii, 1949, 18, 546; *Translated Contents
List of Russian Periodicals*, 1949, No. 7, 52. 35

1950

GORBUKOVA, K.P., PARINA, N.V.

Variability of antigenic properties of drug-resistant strains of
Salmonella typhosa. Zhur.mikrobiol.epid. i immun. 29 no.7:27-29
J1 '58 (MIRA 11:8)

1. Iz Kafedry mikrobiologii 1-go Moskovskogo ordena Lenina meditsinskogo
instituta imeni Sechenova.

(SALMONELLA TYPHOSA, effect of drugs on,
antibiotics, variability of antigenic properties in
resist. strains (Rus))

(ANTIBIOTICS, effects,
on Salmonella typhosa, variability of antigenic
properties in resist. strains (Rus))

PARINA, Ye. V.

BUALNKIN, I. N.; NAGORNAYA, N. A.; 1 PARINA, Ye. V.

"Electrochemical Reversibility and Acid Alkali Denaturation of Globular
Proteins," Biokhin., 14, No. 6, 1949.
Chair of Biochem., Khar'kov State U., -1949-.

BULANKIN, M., PARINA, YE., V., SHERESHEVS'KA, TS. M.

Proteins

Material on reversibility of acid-alkaline denaturation of globular proteins,
Ukr. biokhim. zhur., 22, No. 3, 1950.

9. Monthly List of Russian Accessions, Library of Congress, October 195~~3~~₂, Unclassified.

BULANKIN, I.N.; PARINA, Ye.V.

Changes with age in oxidative phosphorylation. Uch.zap. KHGU
53:135-141 '54. (MIRA 11:11)

1. Kafedra biokhimii Khar'kovskogo gosudarstvennogo universiteta
imeni A.M. Gor'kogo.
(AGE) (PHOSPHORYLATION)

BULANKIN, I.N.; NOVIKOVA, N.M.; ~~PABINA, Ye.V.~~

Chemical nature of so-called structural proteins. Uch.zap. KHGU
53:73-80 '54. (MIRA 11:11)

1. Kafedra biokhimi Khark'kovskogo gosudarstvennogo universiteta
imeni A.M. Gor'kogo.

(PROTEINS)

PARINA, Ye.

v-8

USSR/Human and Animal Physiology - Liver.

Abs Jour : Ref Zhur - Biol., No 1, 1958, 4084

Author : I. Bulankin, Ye. Parina

Inst : Kharkov University, *Chair of Biochem.*, *Sci Res Inst Biol & Biology Faculty*

Title : Qualitative Changes in the Hepatic Ribonucleic Acid in Animals of Various Ages (Relationship Between Phosphorus and Pentose)

Orig Pub : Uch. zap. Khark. un-ta, 1956, 68, 35-41

Abstract : Admitting the possibility of the existence of phosphorylated RNA [ribonucleic acid], the authors studied the relationship between P and pentose in RNA in animals of various ages - in the hope to get an indirect indication of the intensity of the RNA phosphorylation process at various phases of ontogeny. The age of the rats ranged from 1-5 days to 10-12 months. In new-born animals,

Card 1/2

PARILHA, EV

The reversible changes in the oxidative phosphorylation
 in the brain. E. V. Parilha and E. H. Sopetsinskaya.
Uchenye Zapiski Kazansk. Univ. 68, 3-8 (1956); *Russk. Akad. Nauk, Dokl. Khim.* 1957, No. 8090. The brain
 tissue was homogenized in a buffer of pH 7.4. The homogenate
 was incubated for 15 min. at 25°C in the presence of
 pyruvate, KH_2PO_4 , $MgCl_2$, and NaF . After such incubation
 the homogenate was pptd. with CCl_4 (COOH cooled to 0°).
 The ext. was adjusted to pH 8.2 and pptd. with Ba . The
 Ba ppt. was then analyzed for inorg. P (I) and labile P (II) by
 means of 10-min. acid hydrolysis. Observations were
 carried on for 1 to 60 days. The results showed that the
 rate of the processes of esterification of I and resynthesis of
 II receded with age. The quantity of II per unit of absorbed
 O₂ with the age was reduced. Conclusion: With age the
 level of oxidative phosphorylation and energy value of the
 oxidative processes became lowered.

ПАТРИНАЖЕ V

The metabolic changes in the process of animal growth under synthesis stimulation. I. N. Bulankin, S. V. Furtak, R. P. Kurilenko, V. M. Mitrofanovi, K. L. Ziser, and I. N. Sharkevich. *Uchenye Zapiski Kazansk. Univ.* 69, 5-20 (1966); *Russk. Zhur. Khim. Biol. Khim.* 1917, No. 8948. — White rats 90-265 days old were kept for 7 days on a protein-free diet, followed by 2 days of starvation. During the restoration period the amt. of food consumed by the young and old rats was considerably above the control; the increased food consumption was proportionally greater in the young rats. The older rats consumed more food per 1 g. of living substance formed than did the young rats; it was noted that less food consumed for the production of 1 g. of living substance was required during the period of restoration than under normal conditions, owing to the increase in the process of protein and fat synthesis. The total amt. of protein and of fat synthesized during the restoration period was greater in the young than in the old rats, but the relative levels of synthesis of these substances as compared with the control were higher in the old rats. During the period of restoration the rate of protein synthesis was proportional to the formation of the living mass, and the rate of fat synthesis exceeded it. B. S. Levin

med

PARINA, YE. V.

✓ The mechanism of gel formation is acid-base denaturation. N. Bulankin, A. O. Nagorn, Ye. V. Parina, and A. M. Zimkovits (A. M. Gor'ki State Univ., Kharkov, Ukrain. Biokhim. Zhur. 27, 207-214 (Russian summary), 275-3) (1956). Two sets of test tubes of same diam. were used. To each tube of the first set was added 1 ml. of 8% egg albumin and to each tube of the second set 1 ml. of 10% horse serum pseudoglobulin. Each of the sets was then divided into two subsets for the acid and alk. expts., resp. In the acid expt. 0.2 ml. of 5% HCl was added to the egg albumin-contg. tubes, and 0.2 ml. of 10% HCl to the pseudoglobulin-contg. tubes. In the alk. expts. 0.1 ml. of 10% NaOH was added alike to the egg albumin and pseudoglobulin-contg. tubes. To the tubes so acidified or alkalinized was added 0.4 ml. of 0.1N Na acetate, propionate,

malate. To a series of med. mixts. the intensity of effect exerted varying with the length of the C chain of the acid. Acids whose dissociation is depressed by HCl combine electrostatically via their hydrophilic groups with the amino groups or with the C bonds, and by screening the hydrophilic groups of the proteins at the same time increase the no. of such groups. In highly alk. medium the proteins are negatively charged and the fatty acids behave anionically, pointing to the fact that the hydrophobic terminal of the fatty acids, aided by the van der Waals' forces, combine with the hydrophobic side chains of the denatured proteins and increase the no. of long-range groups of the proteins, thereby exerting an arresting influence on the process of gel formation. Cyclic comds., such as phenol and benzoic acid, which in alk. medium act anionically, hasten the gel formation of acidified protein solns., while pyridine and aniline, which act

824

rotated at intervals to detect the time of gel formation. The Na salts of the acids mentioned hasten the formation of the gel in the acidified mixture and arrested it in the alkaline

(3)

PARINAYE V.

6

The specific rotation of denatured protein with reference to the applicability of a polarimetric method for the study of acid-alkali denaturation. I. N. Bulankin, B. V. Parina, and T. M. Shereshevs'ka (A. M. Gor'kii Institute, Uzhgorod, Kharkov). *Ukrain. Biokhim. Zhur.* 24, 204-13 (in Russian, 23-16) (1952); cf. Bulankin, *et al.*, *ibid.* 22, 286 (1950); *C.A.* 44, 8541g. --Two factors affect the increase in optical rotation upon denaturation: (1) the principal factor is related to an unfolding of the globule with micelle formation, at which time chaotic arrangement of asymmetric carbons in the chain that was rolled up converts to an orderly arrangement which produces micellar asymmetry which adds to the optical activity already produced by mol. asymmetry; (2) the 2nd factor is related to structure formation with orientation of the gel. Thus, a stretched chain should give a higher specific rotation than a globular mol. Since, like other native proteins, native egg albumin is characterized by a const. value for specific rotation, it is assumed that micellar (denatured) egg albumin should also be characterized by a more or less const. value for specific rotation. The problem therefore was to sep. from acid and alk. solns. irreversibly denatured proteins whose mol. could exist in a known stretched form, i.e., micellar protein. By knowing the specific rotation of denatured protein, its amt. in the ppt., the amt. of native protein, and its specific rotation, the total specific rotation which should be produced in the soln. after its neutralization is readily calcd. The exptl. values coincided with values calcd. from the specific rotation of denatured and native proteins. The exptl.

mixed with 0.1 N HCl or NaOH and after 1 hr. brought to the isoelec. point. The salt formed was sepd. by dialysis. Insol. albumin was sepd., centrifuged, the centrifugate removed and altered. The ppt. was washed 2 times with water (pH 6.6) and after washing was dild. with alkali to pH 7.5-7.8. The specific rotation of this dild. ppt. was detd. as well as of the supernatant; at the same time N (Kjeldahl) was detd. Specific rotation was detd. for native egg albumin. The specific rotation of dissolved ppt., both acid and alk. albumin, under the conditions of soln., had a const. value of 51°. The specific rotation of supernatant was the same as for native albumin, 36°. Hence a portion of the albumin was reversibly denatured and upon neutralization reverted to the native state. At the same time, a 2nd portion of the albumin, under the effect of acids and alkalis, was irreversibly denatured, and no doubt was the micellar albumin which is characterized by the unfolded form and by a higher and a const. specific rotation. The relation between structure formation of the gel network and optical activity was demonstrated as follows: 30% alkali (0.2 ml./10 ml. of aq. albumin soln.) was added to 5% egg albumin, the latter converting rapidly to a firm gel which was measured for 24 hrs. in a polarimeter. A 2nd gel sample, after 45 min., was heated for 30 min. at 60°, under which conditions the albumin was irreversibly liquefied and the specific rotation of liquefied gel measured. The firm gel gave relatively high specific rotation values, remaining so for 24 hrs., which indicated max. structure formation, which was destroyed by liquefaction, as shown by a decreased specific rotation. The optical activity of the firm gel reflects not only the const. nature of the albumin, and not only denaturation as related to unfolding of the globules with micelle formation, but also formation of an ordered gel network. Clayton P. Hoiway

(2)

PARINA, E.V.

The chemical nature of the so-called structural proteins. (4)
I. N. Bulankin, N. M. Novikova, and E. V. Parina (A.
M. Gorkii State Univ., Kharkov). *Ukrain. Biochim.
Zhur.* 25, 147-53 (in Russian, 153-5) (1953).—To det. the
chem. compn. of structural proteins and the possible varia-
tions caused by different methods of isolation, livers of 3-4-
month-old white mice were extd. with a 30% urea in Edsall
soln. (I), Edsall soln. alone (II), and 10% NaCl soln. in
carbonate buffer. The exts. were pptd. by dilg. with 5
vol. of water at 0°. The isolated structural proteins repre-
sent a liponucleoprotein complex composed of nucleic acids
of phospholipide tissues. Soln. I was a more effective sol-
vent, extg. the proteins almost completely. The slight
difference in ribonucleic acid content of the whole tissue and
the ext. could be due to the presence of free ribonucleic
acid in the cytoplasm, which is not extd. There was no
difference in the various fractions of P extd. with solvent I
or II. NaCl was not suitable. The structural proteins are
obviously preformed in the organism and can be readily
detd. by urea soln. B. Gutoff

BULANKIN, I.N.; PARINA, Ye.V.

Changes with age in the protein synthesis of the organism. Uch.
zap KHGU 108:7-22 '60. (MIRA 14:3)

1. Kafedra biokhimii Khar'kovskogo gosudarstvennogo universiteta.
(PROTEIN METABOLISM) (AGE)

BULANKIN, I.N.; PARINA, Ye.V.

Changes with age in protein synthesis. Report No.2: Incorporation
of S³⁵ methionine into the proteins of liver slices. Uch. zap.
KRGU 108:23-28. '60. (MIRA 14:3)

1. Kafedra biokhimi Khar'kovskogo gosudarstvennogo universiteta.
(PROTEIN METABOLISM) (AGE)

BULANKIN, I.N., akademik; PARINA, Ye.V.; GOLOVKO, N.I.

Albumin synthesis in liver slices of white rats of various ages.
Dokl. SSSR 134 no.6:1461-1463 0 '60. (MIRA 13:10)

1. Kharkovskiy gosudarstvennyy universitet im. A.M.Gor'kogo.
2. AN USSR (for Bulankin).
(PROTEIN METABOLISM) (AGE)

PARINA Ye.V., BULANKIN I.N. ^(Quoted) (USSR)

"Influence of Age on the Synthesis and Renewal of Proteins in the Liver."

Report presented at the 5th Int'l Biochemistry Congress,
Moscow, 10-16 Aug. 1961

BULANKIN, I.N. [Bulankin, I.M.] [deceased]; PARINA, Ye.V. [Paryna, IE.V.];
AGRANOVICH, R.I. [Ahranovych, R.I.]; LYUBARTSEVA, L.A. [Liubartseva,
L.O.]; KOLESNIK, L.S. [Kolesnyk, L.S.]

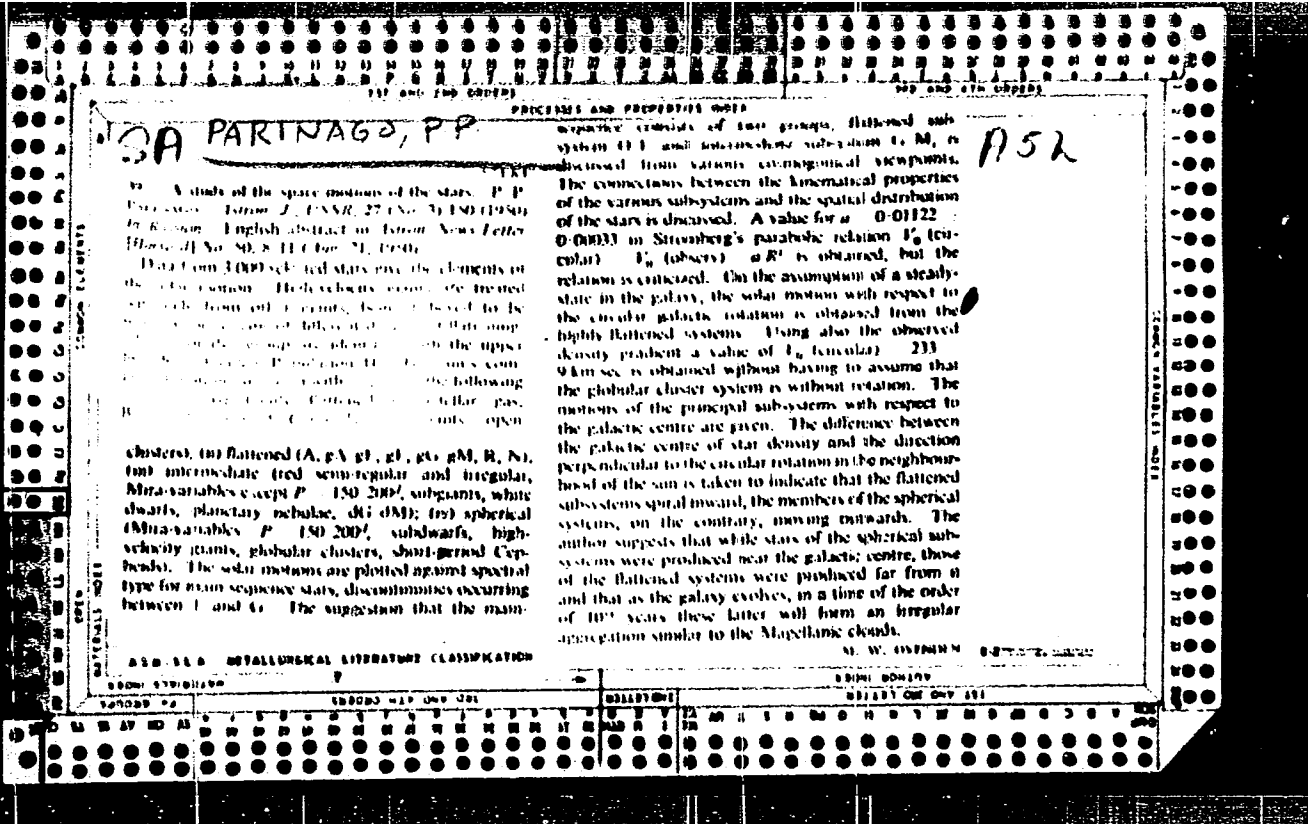
Role of disulfide groups in the formation of gels during acid-
alkaline denaturation of egg albumin. Ukr. biokhim. zhur. 33 no.3:
307-314 Je '61. (MIRA 14:6)

1. Kafedra biokhimi Khar'kovskogo gosudarstvennogo universiteta
im. A.M.Gor'kogo.
(DISULFIDE GROUP) (ALBUMIN) (COLLOIDS)

NAGORNYI, Aleksandr Vasil'yevich, prof. [deceased]; NIKITIN, V.N.; BULANKIN, Ivan Nikolayevich [deceased]; SIROTININ, N.N., prof.; MAKHIN'KO, V.I., dots.; PARIHA, Ye.V., dots.; POLEZHAYEV, Ye.F., red.; LYUDKOVSKAYA, N.I., tekhn. red.

[Problems of aging and longevity] Problema starenia i dolgoletia. Moskva, Medgiz, 1963. 754 p. (MIRA 16:11)

1. Chlen-korrespondent AN Ukr.SSR (for Nagorny). 2. Akademiya nauk Ukr. SSR (for Bulankin). 3. Deystvitel'nyy chlen AMN SSSR (for Sirotinin).
(AGING) (LONGEVITY)



Parini L.S.

GUBENKO, A.B., doktor tekhn.nauk; KOVAL'CHUK, L.M., inzh.; LEVIN, L.S., inzh.;
PARINI, L.S., inzh.

Gluing wood with high-frequency heating. Der.prom. 6 no.8:3-6
Ag '57. (MIRA 10:11)

(Gluing) (Dielectric heating)

PARINI, V.

PARINI, V., kandidat khimicheskikh nauk

~~PARINI, V.~~
Foam plastics. Tekh.mol.23 no.7:30 J1'55. (MIRA 8:10)
(Plastics)

TOP AND 4TH COPIES

PROCESSING AND PROPERTIES INDEX

1ST AND 2ND COPIES

YV

a

New method for determining paraffin in asphalt. V. Paraffin. *Notiz*, No. 5, 18(1933).—This method is based on the low solubility of paraffin in pyridine at 0°. Shake 2.5–3.5 g. of asphalt with 20–70 cc. of a gasoline cut b. 30–40°, let stand for 30 min., filter and wash. Evap. the gasoline and dissolve the residue in lukewarm pyridine and dilute to 100 cc. Cool the soln. to 0° (15 g. of pyridine per g. of asphalt). Cool the soln. to 0°, keep for 30 min. at that temp., filter through a chilled filter and wash with 30 g. of cooled pyridine. Dissolve the paraffin left on the filter with hot CCl₄ and remove asphaltic substances. Agitate the extract with 1:4 (3–4 g. of the mixt. per g. paraffin), filter, wash with CCl₄, dry the paraffin at 110–115° and weigh. Since paraffin particles may have been carried off by the asphalt, cal. the latter in the Gravel test, and add the wt. of paraffin so recovered to the main portion. The amt. of paraffin by 14–17%, depending on the paraffin content in the asphalt.

A. A. Boettling

METALLURGICAL LITERATURE CLASSIFICATION

18000 804100

181 182 183 184 185 186 187 188 189 190 191 192 193 194 195 196 197 198 199 200

19000 19100 19200 19300 19400 19500 19600 19700 19800 19900

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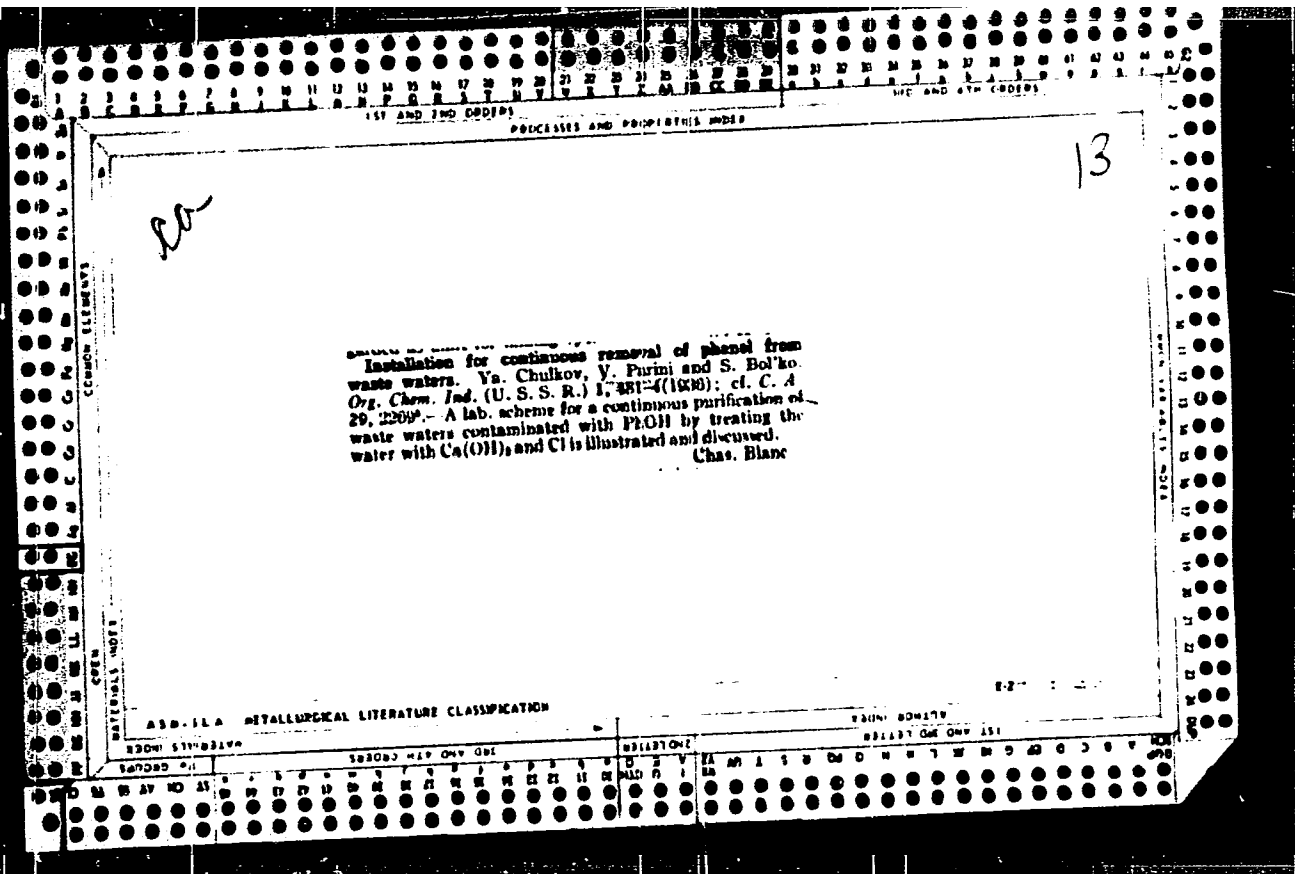
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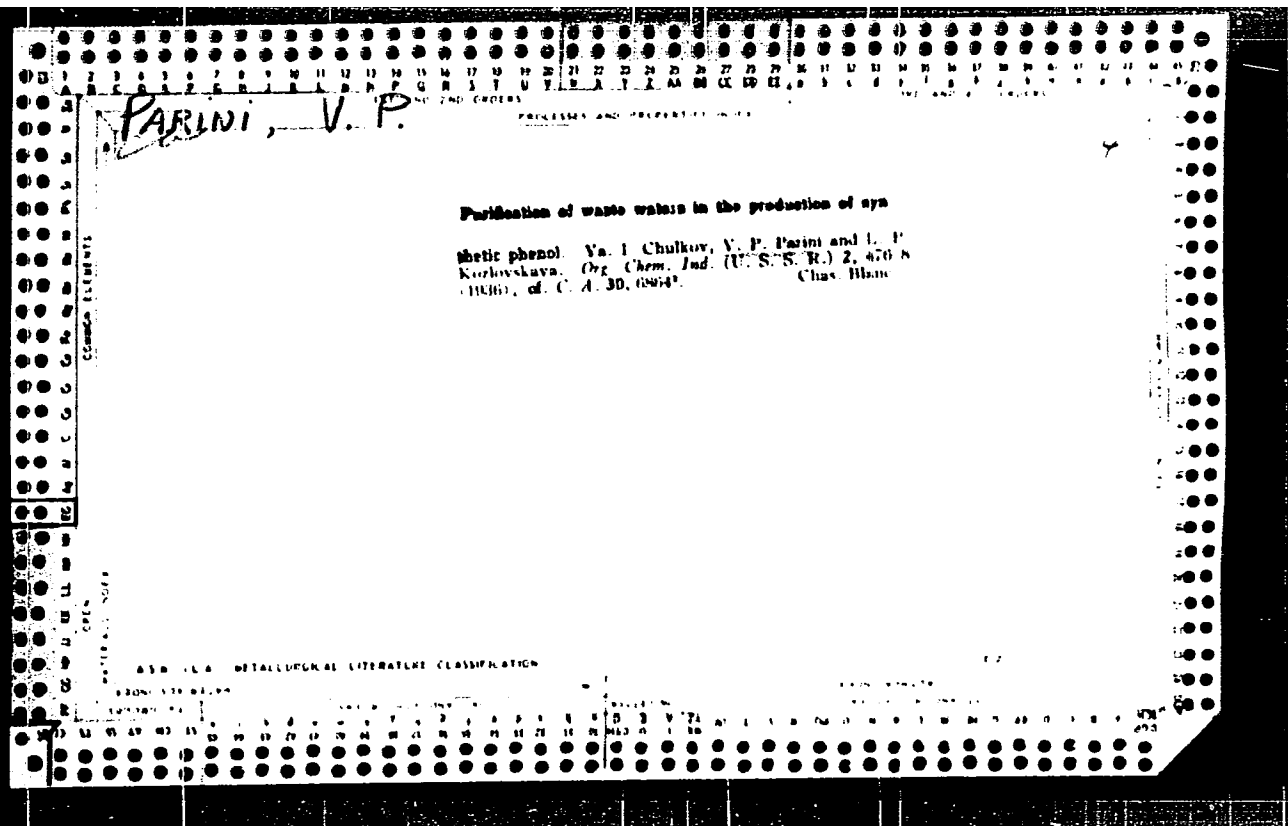
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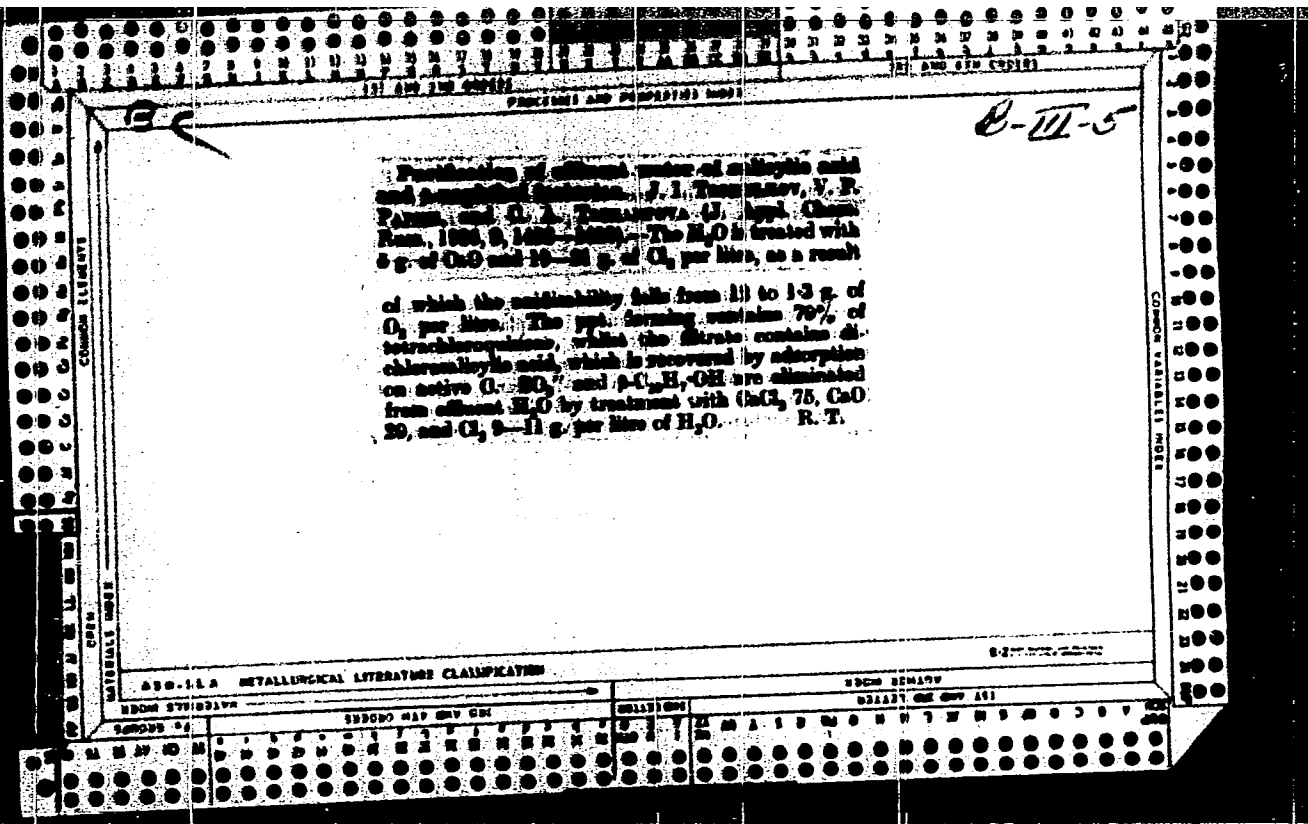
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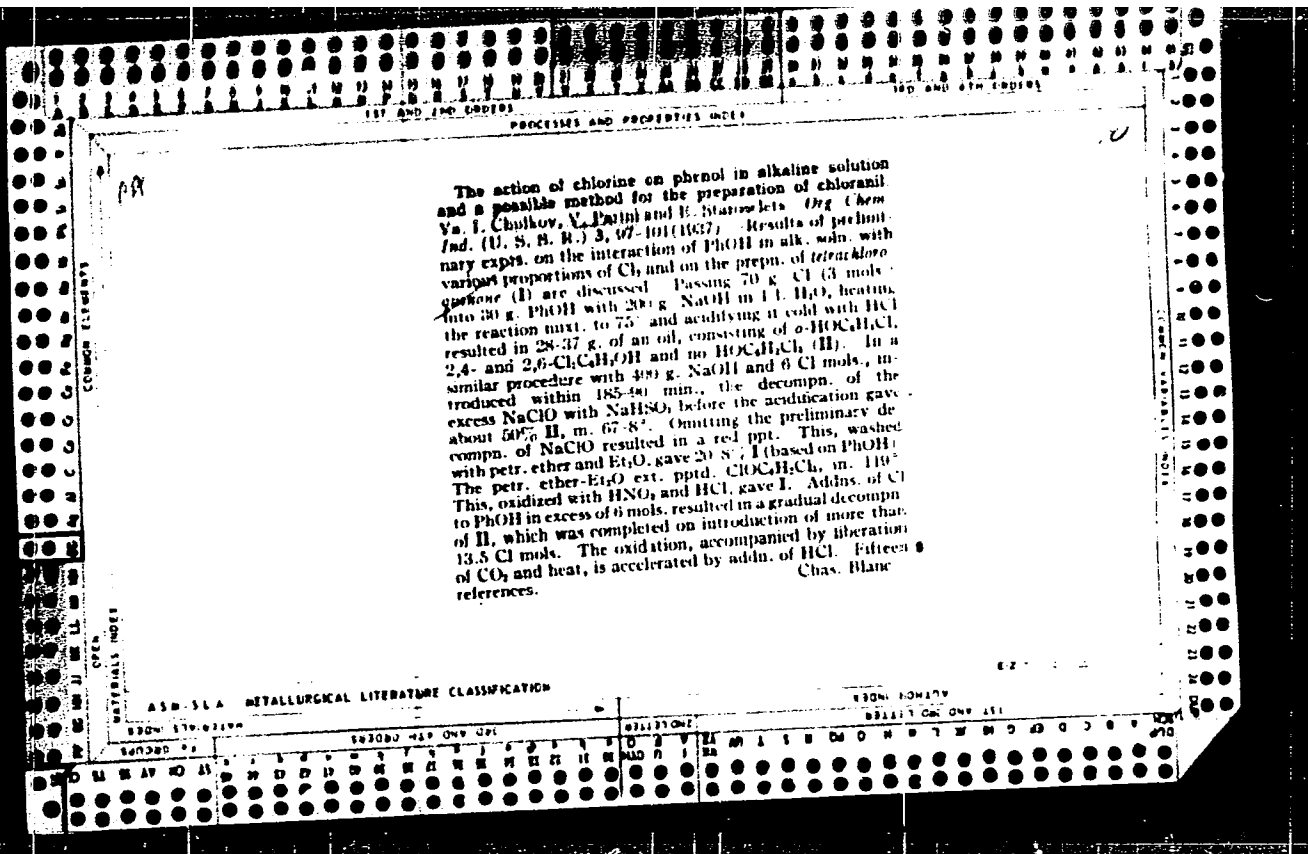
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137 ADD. PMS GROUPS 106 AND 414 (00165)

PROCESSED AND PRIORITIZED INDEX

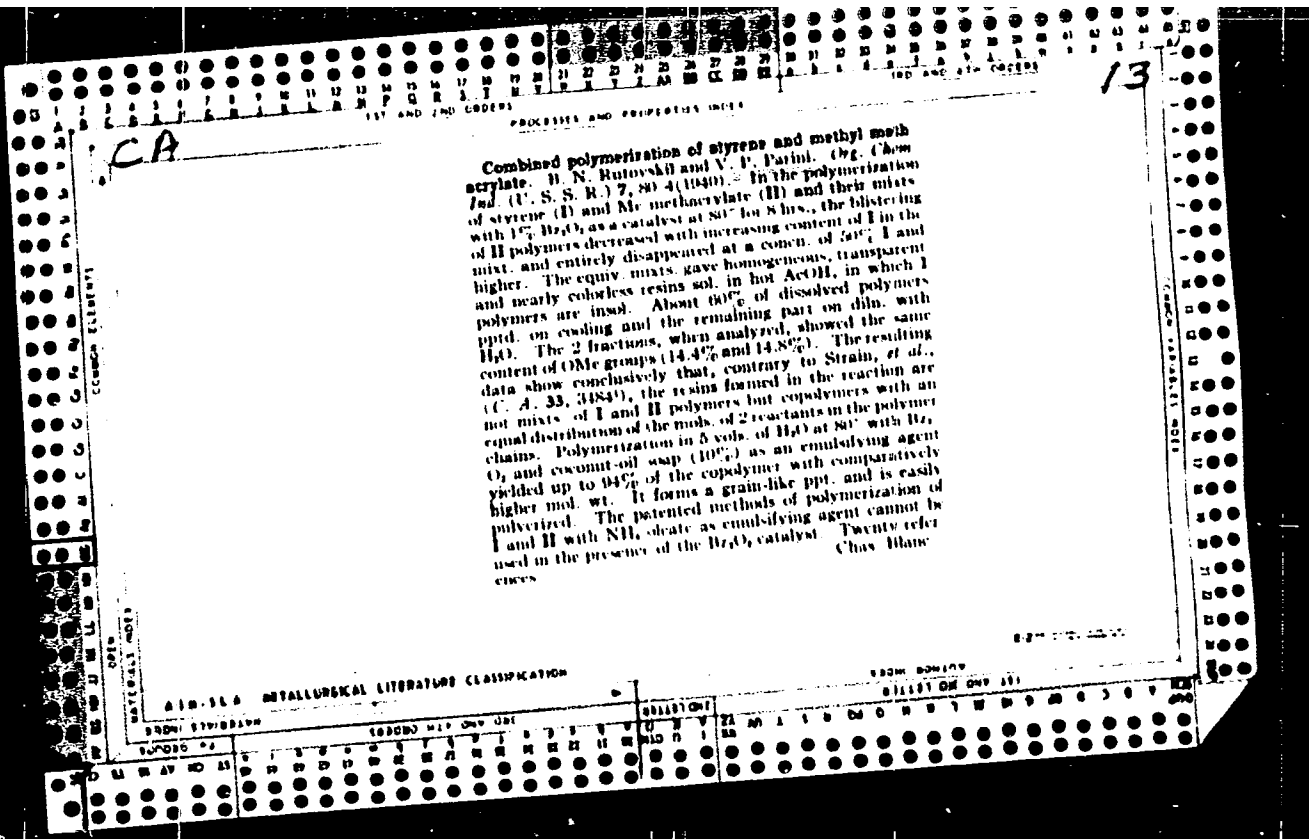
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Preparation of chlorocresols and their oxidation to chlorocatechols. Ya. I. Chirkov, V. P. Parini and B. D. Barabev. *Org. Chem. Intl. (U. S. S. R.)* 3: 310-312 (1937).—Sols. of 10 g. of individual isomeric cresols (Kahlbaum) in a l. of alk. soln. were treated with Cl at room temp. After the decomn. of excess Cl with Na₂HSO₄ and the addn. of HCl, the chlorocresols (I) were expelled by steam distn. At the optimum ratio of 8 mols. Cl to 1 mol. cresol, *o*-cresol gave 4.8 g. 4,6-dichloro-*o*-cresol (II), m. 53-4°, bp 131°, *p*-cresol gave 8.0 g. 2,6-dichloro-*p*-cresol (III), m. 38°, bp 138.9°, and *m*-cresol gave 11-12 g. 2,4,6-trichloro-*m*-cresol (IV), m. 45°, bp 162-3°. I decomposes by distn. at atm. pressure. With increasing Cl ratios the I yields decreased as a result of oxidation and formation of sol. products. These probably are analogous to the acids obtained by Hantzsch (*Ber.* 20, 2781; 22, 1238) from phenols and Cl in alk. solns. II and IV (5 g.) digested with 100 cc. of aqua regia on a water bath for 1.5 hrs. gave, resp., 10 and 25% trichlorotetra-*p*-quinone, m. 233°. III under these conditions gave a red-orange viscous product, which could not be identified. Fifteen references. Chas. Blanc

ADD-51.6 METALLURGICAL LITERATURE CLASSIFICATION

1-27-52

137 ADD. PMS GROUPS 106 AND 414 (00165)



31

CA

Classification of high-molecular compounds and basic
types of polymers of inorganic compounds and of organic
derivatives of silicon, arsenic, lead, etc. A. A. Berlin
and V. P. Pajin, *Uspehi Khim.* 18, 546-56 (1949).—A
crit. review; 40 references. N. Thon

CA

2

Determination of the characteristic viscosity of high polymers. V. P. Pavlov (Chelshinikhler Sci. Research Inst. Chem. & Pharm., U.S.S.R.). *Kolloid. Zhur.* 13, 196-9 (1951).—It follows from Pflanzsch's equation (C.A. 26, 5414) that $[\eta] = \lim_{c \rightarrow 0} (\eta_{sp}/c)$ (η_{sp} being sp. η and c the wt. concn. reckoned for monomer) = $2.375 A^2 / A$. As the const. K can be detd. from one expt., one expt. only is needed to det. $[\eta]$. This detn. is better than some of the detns. suggested by Billmeyer (C.A. 43, 6981e) as shown by using literature data on η of polystyrene in cyclohexanone and benzene. J. J. Hirsman

1151

PARINI, V. P.

Author: Kraft, M. Ya. and Parini, V. P.

Title: On the nature of red phosphorus.

Journal: Doklady Akademii Nauk SSSR, 1951, Vol. 77, No. 1, pp. 57

Subject: Chemistry

From: D.S.I.R. Oct 51

PARINI, V.P.

The nature of some modifications of red phosphorus, 1. Products of polymerization of white phosphorus in the medium of organic halogen derivatives. M. Ya. Kraft and V. P. Parini (S. Ordzhonikidze All-Union Chem.-Pharm. Inst., Moscow). *Soviet State Chemical Acad. Nauk S.S.S.R.* 1, 710-22 (1953); cf. Kraft, *et al.*, *C.A.* 45, 2890d.—Photopolymerization of white P in org. halides yields insol. substances which contain, besides P, some C and halogen; these substances are not the products of sorption nor solid solns. but are polymers of P which contain halogen atoms and org. radicals as terminal groups

of the polymer structures. [For photoreactions of P in org. liquids, cf. Pedler, *Trans. Chem. Soc.* 57, 599 (1930); Colson, *Compt. rend.* 146, 401 (1908); *C.A.* 2, 1305; Lottermoser, *C.A.* 3, 392; Michaelis and Arendt, *Ann.* 314, 250 (1901); 325, 331 (1902); Rozen, *C.A.* 31, 1719^g.] Dry solns. of white P satd. at 20° in MeI, EtI; BuI; iso-AmI, PhI, BuBr, PhBr, and PhCl in sealed ampuls in CO₂ atm. were irradiated at 60-80° with a Hg-lamp radiation for 15-180 hrs. No pressure developed in the tubes. Solns. in PhCl and RBr gave small amts. of ppt., and most work was done on the more productive solns. of RI type. The products in these cases were powders (violet from MeI, orange from larger halides) which contained about 80% P, 5-17% iodine, 1-7% C. All oxidized slowly on contact with air and oxidized vigorously on contact with 5N HNO₃, liberating iodine and N oxides. None were sol. in org. solvents. Prolonged contact with H₂O liberated the halogen in ionic form, but the C content remained unaffected; as the halogen was removed the products turned lighter in color. Oxidation with HNO₃ yielded RPO₃H, where R is the radical of the org. halide used as the solvent; small amts. of org. derivs. which were probably R₂PC₂H were

obtained, but in amts. which did not permit identification. In a typical expt. 177 g. PhI was shaken in the dark with 12.4 g. white P for 3 days, the insolubles filtered off (3.7 g.) and the sealed ampul under CO₂ was exposed to illumination for 21 days at 60-80°, yielding 6 g. orange powder, which when boiled 1.5 hrs. with H₂O lost all iodine content, and retained 5.78% C; to 4.4 g. dried product was added a little H₂S, followed by 20 vols. 5N HNO₃; the resulting soln. evapd. on a steam bath, heated briefly with 1 ml. fuming HNO₃, repeatedly evapd. with H₂O to remove HNO₃, the residue neutralized at 100° with dry Na₂CO₃ (until CO₂ evolution stopped) ground to a powder and extd. with hot 95% EtOH; evapn. of the ext. gave a residue of crude phosphonic acid which was taken up in H₂O and treated with Pb(OAc)₂, yielding Pb nithophenyphosphonate, C₆H₅O₂NPPb (I), 0.5 g. The filtrate was treated with H₂S to remove excess Pb, the filtrate was repeatedly evapd. with H₂O to remove AcOH and the residue was satd. with Na₂CO₃, evapd. to dryness, dried at 150-70°, and extd. with hot 95% EtOH; the concd. ext. treated with alc. AgNO₃ gave only a trace of cloudiness indicating a small amt. of a phosphonic acid. I (0.4 g.) taken up in 20 ml. boiling 70% AcOH was dissd. with 2 parts H₂O and treated with H₂S, filtered, the filtrate evapd. several times to remove AcOH, evapd. to dryness, yielded 0.2 g. brownish solid, which gave m-O₂NC₆H₄PO(OH)₂, m. 132-3° (from C₆H₅-Et₂O). The reaction product from 220 g. iso-AmI and 7.4 g. P amounted to 8 g. (after 80 hrs. irradiation) and on treatment described above gave 4.3% (based on the wt. of polymer obtained) Pb isoamylphosphonate, which gave the free acid, m. 150°. The following yields of Pb₂PR (based on wt. of polymer obtained) are reported (R given): Me, 0.9%; Et, 4.1%; Bu, 4.9%; m-O₂NC₆H₄,

11.3%. I. Halogen containing forms of red phosphorus. V. P. Pirini and M. Ya. Kraft. *Ibid.* 723-8. Polymerization of white P in PBr_3 yields Br-contg. red P; in the presence of iodine the product formed contains iodine. Partial substitution of the halogen atoms in such products was attained and oxidation of such products yielded phosphonic acids, thus showing that the halogen contg. forms of red P are not merely adsorption products (cf. Schenck, *Ber.* 36, 079, 4202(1903)) since treatment of such with organometallic reagents should have yielded tertiary phosphine derivs. Hence the halogen atoms in such forms of red P are terminal atoms in the generally polymeric structure of red P. Refluxing 88 g. white P in 740 g. PBr_3 10 hrs. gave 97 g. red P ppt., which was filtered off, washed with CCl_4 , extd. with hot CCl_4 and Bz_2O . When this product was shaken 1.5 hrs. with H_2O , it lost 8.6% of its Br content (original content 15.4%); on boiling 1.5 hrs. in H_2O , the product turned orange and contained 95.7% P, which is close to the content expected after replacement of Br by H groups. To $PhMgBr$ (from 34.1 g. $PhBr$) was added 70 g. red P described above (contg. Br) and the mixt. was refluxed 2 hrs. without evidence of visible reaction. After treatment with H_2O and dil. H_2SO_4 , the Bz_2O -washed solid amounted to 67 g. The aq. layer was extd. with Bz_2O and the combined org. layer on evapn. gave some Ph_3P . The red P residue contained 0.8% Br; on further treatment with $PhMgBr$ the Br content dropped to 0.4%, while the org. layer again failed to show any evidence of Ph_3P or

derivs. Oxidation of this product with 5N HNO_3 yielded no organo-P derivs. Ultraviolet absorption of 40 g. white P in 500 g. PBr_3 in the presence of 60 g. iodine, under CO_2 7 days, gave 43 g. bright red ppt. contg. 20.0% P and 40.0% iodine (error in expt. part). This product (2) g.) was added to $MeMgI$ from 33.5 g. MeI under H_2 and was refluxed 3 hrs., filtered and the ppt. washed with Bz_2O under H_2 ; the product (II) was a red powder which did not fume in air and contained 45.5% iodine; oxidation of 5 g. of this with 5N HNO_3 gave no phosphinic acids nor tertiary phosphine oxides, but a small amt. of Ph methylphosphonate was obtained. II (14 g.) was treated with 10 g. Bz_2O in xylene and the mixt. after refluxing 4 hrs. under CO_2 was cooled, treated with $EtOH$, filtered, the ppt. washed with 2N HCl , H_2O , $MeOH$, Bz_2O , dried *in vacuo*, yielding 10 g. red-orange solid, which with HNO_3 gave 1.3 g. Ph ethylphosphonate in a crude form; treatment of this with fuming HNO_3 , removal of Ph with H_2SO_4 , followed by treatment described in Part I (preceding abstr.) gave 0.3 g. Ph ethylphosphonate (III), traces of possible Ph diethylphosphinate but no $Et_2P(O)$. The same reaction with Bz_2O in Bz_2O gave the same result but the yield of the organo-deriv. was much smaller. III (0.4 g.) in 20 ml. hot 70% $AcOH$ was dild. with 2 parts H_2O , treated with H_2S , filtered, repeatedly evapd. with H_2O , yielding 0.12 g. $Et_2P(O)H_2$, m. 44-5° (from Bz_2O). Com. red P (Schering Anorg. Phosphor Pulver; 10 g.) was refluxed with xylene soln. of Et_2Zn ; no phosphonic acids were isolated after the above described treatment of the product. When 5 g. iodine-contg. red P was kept 4 days in 80 ml. dry $MeOH$,

3/3 M. Ya. Krast & V. P. Pravin
 there was left after evapn. of MeOH and washing the product with MeOH and Et₂O, 3 g. orange solid; oxidation of this with HNO₃ yielded no iodine. Similar treatment with EtOH gave 3.1 g. product which contained 6.3% iodine. Repeated treatment with fresh portions of EtOH (finally at 60-70°) gave 3 g. orange residue which was free of iodine. Similar treatment with tie-AmOH gave a product with 16.3-16.5% iodine even after 5 days at 60-80°. Thus the replacement of the iodine depends on the nature of the reagent used, larger mole. being less effective owing to steric hindrance in the attack of the P polymer network.

III. Polymerization of white phosphorus in tertiary phosphines. *Ibid.* 729-31; cf. *Royce, loc. cit.*—Photopolymerization of white P in the presence of R₃P gave solid, insol. polymers which contain org. radicals as terminal groups of the red P network. Illumination with ultraviolet of 1.9 g. white P and 1.4 g. Et₃P (b. 126-8°) 100 days at 00-70°, followed by transfer of the contents into (CH₂Cl)₂, extrn. of the solid with several portions of fresh hot solvent, left behind 0.4 g. dark solid which oxidized with 5N HNO₃ gave 0.01 g. P-ethylphosphonate. No Et₃PO₂H nor Et₃PO was found. Similarly 2 g. white P and 3.5 g. Ph₃P illuminated 125 days at 80-90° gave 0.9 g. red P powder, which on oxidation with HNO₃ gave 0.02 g. Ph-alkoxyphosphonate. No secondary or tertiary deriva. of P were found. If the product were simply an adsorption product, the latter should have been recovered from the oxidation. The conclusions of these 3 papers are that the case, red P is a polymer with terminal groups composed of O and HO groupings. Thus red P, although contg. as much as 90% P, is truly a compd., not an element in the true sense.

O. M. Kozlov

PARINI, V.P., kandidat khimicheskikh nauk.

Protein-vitamin paste. Nauka i zhizn' 20 no.11:35 N '53. (MLBA 6:11)
(Feeding and feeding stuffs)

IVANOV, P.P.; PARINI, V.P.

Making a popular book scientific ("Miraculous atom". A. Buianov.
Reviewed by P.P. Ivanov, V.P. Parini.) Khim.v shkole 10 no.2:71-
74 Mr-Ap '55. (MIRA 8:7)
(Chemistry--Juvenile literature) (Buianov, A.)

PARINI, V. P.

USSR/Chemistry of High-Molecular Substances, F

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 61692

Author: ~~Berlin, A. A.~~, Parini, V. P.

Institution: None

Title: On Inorganic Polymers

Original

Periodical: Khim. nauka i prom-st', 1956, 1, No 1, 44-51

Abstract: A review. Bibliography, 88 ~~titles~~

Card 1/1

The use of chemical methods for the diagnosis of tumors of the adrenal cortex: V. P. Farin and G. G. Belkovich (All-Union Inst. Exptl. Endocrinol., Moscow). *Problemy Endokrinol. i Gormonoterp.* 2, No. 3, 8-5 (1955). The

2

method used is a modification of the method of Jensen (C.A. 47, 2346a). The tests performed with pure solms of dehydroandrosterone and the neutral extracts of urine proved that the calcns. according to Turak (C.A. 49, 5257) give more correct values than according to Jensen (loc. cit.). The optical density was measured with blue (440 mμ) and yellow (600-740 mμ) filters. The ratio $OP_1:OP_2$ was calcd., where OP_1 was the optical density with yellow filter and OP_2 the optical density with blue filter. The total excretion of 17-ketosteroids by 6 patients with hyperfunction of adrenals was definitely above normal, up to 800 mg. per 24 hrs. In 2 cases in which malignancy was proved by biopsy the color of the test solms was in one case greenish blue and $OP_1:OP_2$ was 0.67-0.78 and in the other color was blue-purple and $OP_1:OP_2$ was 1.25. In 4 other cases, 2 with hyperplasia and 2 with adenomas of the adrenals, the color of the test solms was yellow to brown and $OP_1:OP_2$ was 0.31-0.46. Application of the method to the urine of 40 clinically healthy persons and patients suffering from some endocrine disorders not connected with the adrenals gave neg. reactions in all cases. The color of the test solms was yellow or brown and $OP_1:OP_2$ never was higher than 0.45. It can be concluded that the reaction used is pos. only in cases of adrenal tumor (malignant).

A. V. Kostoulov

PARINI, V.P.

FILATOV, I.G.; PARINI, V.P.

"Fundamentals of the manufacture of gas-expanded plastics and elastomers" by A.A.Berlin. Reviewed by I.G.Filatov, V.P.Parini.
Khim.prom. no.4:254-255 Je '57. (MIRA 10:10)
(Plastics) (Elastomers) (Berlin, A.A.)

PARINI, V.P.

KOP'YEV, A.A. [deceased]; ZAYONCHKOVSKIY, A.D.; YABKO, Ya.M.; PARINI, V.P.;
PARAMONOV, V.G.; GLUZMAN, G.M.; GRIGORIADI, M.G.

Increasing water repellency in leather by means of a velan-type
compound. Leg.prom. 17 no.7:23-25 51 57. (MLRA 10:9)
(Leather Industry)

251-65 EPA(s)-2/EWT(m)/EFF(c)/EPR/EWT(j)/P/EWA(s) Pp-1/Pr-1/PS-1/Pt-10
EPL W/JW/RM

ACCESSION NR: AP5006424

S/0062/65/000/001/0204/0204

AUTHOR: Berlin, A. A.; Parini, V. P.

TITLE: Reaction products of anthraquinone with aromatic diamines

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 1, 1965, 204

TOPIC TAGS: polymer, anthraquinone, p phenylenediamine, benzidine, little soluble polymer, thermally stable polymer

ABSTRACT: Benzidine and p-phenylenediamine react with anthraquinone at 300C in an inert atmosphere to form black products whose probable structure is



where Ar = C₆H₄ or (C₆H₄)₂. The reaction product for phenylenediamine is partly soluble in H₂SO₄. When heated in an inert atmosphere for 1 hr, its weight loss is

Card 1/2

L 29316-65

ACCESSION NR: AP5006424

2% at 400C, 4% at 500C, and 7.5% at 600C. The reaction product for benzidine is fully soluble in H₂SO₄ and partly soluble in pyridine, xylene, and dimethylformamide. On evaporation of the solvent, the product forms stiff, brittle films. When heated for 1 hr, its weight loss is 2% at 300C, 5% at 400C, and 8% at 500C. Orig. art. has: 1 formula.

{B0}

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences, SSSR)

SUBMITTED: 30Nov64

ENCL: 00

SUB CODE: OC, Gc

NO REF SOV: 000

OTHER: 000

ATO PRESS: 3197

Card 2/2

5(3)

AUTHORS:

Berlin, A. A., Papini, V. P.

SOV/1958-18-4-20, 22

TITLE:

On Some Characteristics of Polynuclear Aromatic Compounds and on the Synthesis of Polymers Resistant to Heat (O nekotorykh osobennostyakh mnogoyadernykh aromaticheskikh soyedineniy i sinteze termostoykikh polimerov)

PERIODICAL:

Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 4, pp 122 - 127 (USSR)

ABSTRACT:

The demands made on polymer substances, first of all with respect to their high heat resistance, have been increasing during the last years due to the rapid development of airplane construction and rocket technology. The heat resistance of polymers depends on the chemical bonds strength in the main chains and the side groups of the macromolecules. The lower the free energy of the bonds, the higher is the temperature limit of the existence of a chemical compound. The compounds mentioned in the title have a high resistance to heat. This is caused by the characteristics of the chemical

Card 1/5

On Some Characteristics of Polynuclear Aromatic Compounds SOV/13-58-4-20/22
and on the Synthesis of Polymers Resistant to Heat

binding of such substances. In plane systems of conjugated bonds (benzene, naphthalene, and other molecules) the potential energy of the π -electrons is extremely low. The binding formed by σ -electrons in the aromatic compounds is covalent; it is similar to the metallic one. The chemical bond in these compounds should, according to its character, be termed as metallic-covalent. The resistance to heat of the aromatic nuclei is connected with the advantageousness of such a bond with respect to energy (due to the low potential energy of the π -electron). With the increase of the system of conjugated bonds the energy of the π -electrons decreases still further. Thus, the resistance to heat of the molecule should increase with the increasing number of conjugated benzene nuclei forming the molecule. The accumulation of the benzene nuclei can take place in the following ways: Formation of:
a) Linear polyphenyls, b) Polyaromatic compounds with condensed nuclei in one line, c) Ramified polyaromatic compounds with a main chain of linearly bound or

Card 2/5

On Some Characteristics of Polynuclear Aromatic Compounds SOV/133-58-4-20/22
and on the Synthesis of Polymers Resistant to Heat

condensed nuclei, d) Condensed aromatic compounds with a plane configuration of the macromolecules of the "Parquet" type, e) Three-dimensional structures. The "blurring" of the electron cloud in these polymer structures allows the formation of "biradicaloids" or "polyradicaloids", in the latter case also that of polyradicals (Ref 2). As far as it could be experimentally proved, the resistance to heat of the molecules in the cases a. and b. is increased (Refs 3-5). To a still greater extent this is the case in the cases d. and e. (Refs 6,7). The authors deaminated benzidine by the action of active copper. It was obtained by the ammoniacal cuprous oxide solution on bis-diazo-benzidine compound. A dark red non-meltable polymer was formed, which was partly soluble in organic solvents, and contained nitrogen (see probable formula). A deamination carried out in a similar way with benzidine dicarboxylic-3,3'-acid yielded an externally similar product, which was, however, soluble in alkalis and soda. This substance (Formula) is decarboxylated on heating; thus, a linear polyphenylene

Card 3/5

On Some Characteristics of Polynuclear Aromatic Compounds SOV/53-38-4-20/22
and on the Synthesis of Polymers Resistant to Heat

can be obtained. Polymers with aromatic nuclei in the side chain alone consist of more flexible chain molecules. Therefore they are less brittle and less resistant to heat than polyphenylenes. The strength of their intra and intermolecular bonds can, however, be increased by a sufficiently great number of condensed nuclei forming side groups. From all this it may be concluded that the chemistry of the aromatic polymers offers possibilities of producing highly heat resistant materials, having a complex of extremely interesting properties. There are 1 figure, 1 table, and 23 references, 5 of which are Soviet.

ASSOCIATION: Moskovskiy tekhnologicheskii institut myasnoy i molochnoy
produktsii (Moscow Technological Institute of Meat
and Milk Production -MTIEMF) Laboratoriya vysokomolekul'yar-
nykh soyedineniy (Laboratory of High-Molecular Compounds)
Vsesoyuznyy nauchnyy institut tekstil'noy i legkoy promysh-
lennosti (All Union Correspondence Institute for Textile
and Light Industry) Kafedra obshchey khimii (Chair of General
Chemistry)

Card 4/5

SOV/62-58-12-21/22

5(3)

AUTHORS:

Parini, V. P., Berlin, A. A.

TITLE:

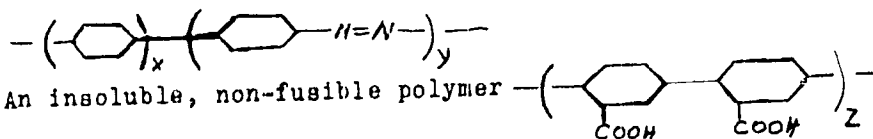
Letter to the Editor (Pis'ma redaktoru)

PERIODICAL:

Izvestiya Akademii nauk SSSR, Otdeleniye khimicheskikh nauk, 1958, Nr 12, pp 1499-1499 (USSR)

ABSTRACT:

In this letter to the editor the authors state that: Multi-nuclear aromatic compounds are characterized by a special resistance to heat. During the last years the synthesis of polyphenylenes has been devoted great attention. We synthesized such compounds by way of the aromatic bis-diazo compounds. Benzidine-bis-diazonium-4,4' salts separate nitrogen on the action of monovalent copper and form a non-fusible nitrogen containing polymer of the probable structure:



Card 1/2

Letter to the Editor

SOV/62-58-12-21/22

was obtained by the bis-diazotization of benzidine carboxylic-3,3' acid by the mentioned method with subsequent decomposition of the bis-diazo compound. On heating it separates carbonic acid. Hard foils can be produced from its solutions. The produced poly acid offers new possibilities of synthesizing linear polyphenylenes and their derivatives. Similar transformations can also be obtained by way of the di-(N-nitroso-N-acetyl) diamines.

ASSOCIATION: Laboratoriya anizotropnykh struktur Akademii nauk SSSR
(Laboratory of Anisotropic Structures, Academy of Sciences, USSR)

SUBMITTED: June 12, 1958

Card 2/2

5(3)

AUTHORS:

Berlin, A. A., Parini, V. P.

SOV/62-59-9-29/40

TITLE:

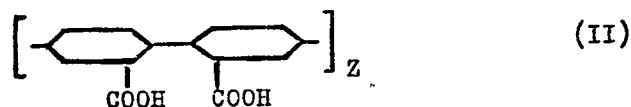
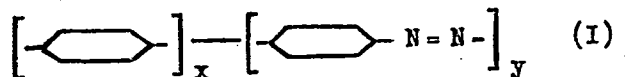
On the Synthesis of Aromatic Polymers Via Bis-diazo Compounds

PERIODICAL:

Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk,
1959, Nr 9, pp 1674-1676 (USSR)

ABSTRACT:

In the present paper the synthesis of polycyclic aromatic compounds becoming of increasing interest owing to their high chemical stability is reported. The following observation was utilized for synthesis: The biphenyl-4,4'-bisdiazonium salts split off nitrogen on treatment with copper (I) compounds and form a nitrogen containing non-fusible polymer with the tentative composition



Card 1/3

On the Synthesis of Aromatic Polymers Via
Bis-diazo Compounds

SOV/62-59-9-29/40

In this manner a bis-diazotized benzidinedicarboxylic acid was transformed to a bisdiazo compound of the type (II), which contained approximately 2% nitrogen. (I) and (II) are not fusible, both dissolve in concentrated H_2SO_4 , giving a purple solution, (I) is also soluble in alkali and H_2O formamide. From the low viscosity of their solutions the authors conclude (I) and (II) to have a low degree of polymerization. The results of the ultimate analysis are given in a table. The compound (II) was found to contain 1 carboxyl-group to each benzene ring. The existence of free radicals in both compounds was verified by electron paramagnetic resonance spectra. Furthermore, it is concluded, that both compounds contain azo groups, (I) 1 azo group/4 benzene rings, and (II) 1 azo group/10 benzene rings. Cl and O-O function as terminal groups. The stability is explained by the high degree of dislocation of the π -electrons. The weak electron paramagnetic resonance of (II) is explained by the destruction of coplanarity of the molecule by the two COOH-groups. Investigation of the thermal stability of the substances showed (I) to decompose at 400 and (II) at 450°C. After heating, (II) was insoluble in alkaline mediums. Finally, the authors express their thanks to

Card 2/3

On the Synthesis of Aromatic Polymers Via
Bis-diazo Compounds

SOV/62-59-9-29/40

A. E. Kalmanson and L. A. Blyumenfel'd for taking and interpreting the EPR-spectrum, and I. P. Yakovlev for the infrared spectrum. There are 1 figure, 1 table, and 4 references, 3 of which are Soviet.

ASSOCIATION: Laboratoriya anizotropnykh struktur Akademii nauk SSSR
(Laboratory for Anisotropic Structures of the Academy of Sciences, USSR)

SUBMITTED: February 25, 1959

Card 3/3

PARTIAL V.P.

PHASE I BOOK EXPLOITATION SOV/498*

International symposium on macromolecular chemistry. Moscow, 1960.

Mezhduimirovyy simpozium po makromolekulyarnoy khimii SSSR, Moskva, 14-18 iyunya 1960 g.; doklady i avtoreferaty. Sektziya III. (International Symposium on Macromolecular Chemistry Held in Moscow, June 14-18, 1960; Papers and Summaries) Section III. [Moscow, Izd-vo AN SSSR, 1960] 469 p. 55,000 copies printed.

Teub. Ed.: P. S. Kashina.

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

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

COVERAGE: This is Section III of a multivolume work containing papers on macromolecular chemistry. The articles in general deal with the kinetics of polymerization reactions, the synthesis of special-purpose polymers, e.g., ion exchange resins, semiconductor materials, etc., methods of catalyzing polymerization reactions, properties and chemical interactions of high molecular materials, and the effects of various factors on polymerization and the degradation of high molecular compounds. No personalities are mentioned. References given follow the articles.

Kabek, T. I., and J. Kaszider (Poland). Chlorination of Phenol-Formaldehyde Resins	27
Alexandru, L., M. Orsila, and A. Ciocanel (Rumania). Cyanocetyl and Malinopropyl Ethers of Polyvinyl Alcohol	34
Kakubovich, A. Ya., G. Ya. Gordon, V. I. Maslennikova, G. I. Ivanov, V. I. Tratyakova, and N. M. Kozlova (USSR). Study of the Chemical Conversions of Polycarbonates	44
Pozdjak, B. A., M. S. Fed'ditsyn, and E. M. Beluzayna (USSR). Chemical Interactions and Mechanism of the Activating Action of Double Systems of Vulcanization Accelerators	65
Mikhaus, J. M., A. P. Vorob'yev, G. A. Shirokova, and M. P. Gerasimova (USSR). Ethers of Sulfuric acid and Polyvinyl Alcohol	73
Molnár, Z., T. Holly, and G. Thurzó (Hungary). The Interaction of Aromatic Amines and Polyvinyl Chloride	79
Gardner, M. A., B. E. Davydov, B. A. Kravtsov, I. M. Kuznetsov, L. S. Polak, A. V. Soshchikov, and R. M. Vozhenko (USSR). The Production of Polymeric Materials Which Exhibit Semiconductor Properties	85
Miksa, J., and L. L. Kovács (Hungary). Chemical Properties of Bipolar Ion-Exchange Resins	93
Kabek, T. I., and J. Morawiec (Poland). Effect of the Structure of Organic Anion Compounds on the Properties of Anion Exchange Resins From Polystyrene	102
Saldadze, K. M. (USSR). The Problem of the Effect of the Structure of Ions on Ion-Exchange Processes Between Ionites and Electrolyte Solutions	107
Berlin, A. A., B. I. Kozonkiz, and V. P. Partin (USSR). Production and Properties of Some Aromatic Polymers	115
Trutyanskaya, Ye. V., I. P. Losev, A. S. Tsvilina, S. B. Bakarova, G. Z. Nefedova, and Lu Helen-Jao (USSR). Chemical Conversions of Insoluble Copolymers of Styrene	124
Lindemann, V. (Poland). Thermal Stability of Strongly Basic Anion Exchange Resins	146 40

83818

15-8106 also 2209

S/190/60/002/005/008/015
B004/B067

AUTHORS: Berlin, A. A., Liogon'kiy, B. I., Parini, V. P.

TITLE: Production and Properties of Some Aromatic Polymers 1

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 5,
pp. 689-697

TEXT: In an earlier paper A. A. Berlin and V. P. Parini published the synthesis of homologous polyphenyl series by decomposing bis-diazobenzidine or bis-diazobenzidine-3,3'-dicarboxylic acid by means of salts of monovalent copper (Ref. 11). The present paper reports on this reaction and on the properties of the products obtained. The bis-diazo compounds were decomposed with an ammoniacal solution of copper sulfate, which had been stabilized with hydroxylamine hydrochloride. No different results were obtained with air supply or in argon atmosphere. An addition of the diazo solution to the copper solution, however, yielded products with higher molecular weight than those obtained in the inverse process. Analyses of the products obtained are given in Table 1. Nitrogen could not be completely removed. The chlorine content decreased with increasing

Card 1/3

83818

Production and Properties of Some Aromatic
Polymers

S/190/60/002/005/008/015
B004/B067

molecular weight (Table 2). So, it is probably bound to the end group. The following polymer structure is assumed: $\text{Cl}-\left[\begin{array}{c} \text{C}_6\text{H}_3 \\ | \\ \text{R} \end{array} - \begin{array}{c} \text{C}_6\text{H}_3 \\ | \\ \text{R} \end{array} - \text{N}=\text{N} \right]_x - \left[\begin{array}{c} \text{C}_6\text{H}_3 \\ | \\ \text{R} \end{array} - \begin{array}{c} \text{C}_6\text{H}_3 \\ | \\ \text{R} \end{array} \right]_y - \text{Cl}$;

R = -H or -COOH. The content of azo groups increases with increasing length of the chain. The carboxyl group in ortho-position favors the elimination of nitrogen. Fig. 2 shows that the loss in weight on heating (up to 450°C) attains rapidly a limit for every temperature. The infrared spectra taken with an MKC-11 (SIKS-11) spectrometer proved the mere para-substitution in the aromatic ring as well as a probably quinoidal structure of the ring and rod form of the molecules. The latter fact explains the anomalous viscosity. The spectrum of electron paramagnetic resonance taken with D. G. Semenov's radiospectrometer (cf. Ref. 11) indicates unpaired electrons whose concentration is of the order of 10^{18} - 10^{19} and confirms the radical character of the reactions. The shortness of the polymer chains obtained is explained by the formation of stable biradicals which, due to the delocalization of unpaired electrons, have only a low reactivity. The formation of such biradicals was proved by reacting polymers with p-diethynylbenzene at high temperatures. Unmeltable and insoluble products were formed. The magnetic properties and the electrical conductivity of

Card 2/3

83818

Production and Properties of Some Aromatic
Polymers

S/190/60/002/005/008/015
B004/B067

the polymers will be described later. The authors thank I. A. Blyumenfel'd.
Yu. Sh. Moshkovskiy, and A. A. Slinkin for studying the spectra and
magnetic properties. There are 2 figures, 2 tables, and 19 references:
8 Soviet, 8 US, 2 German, and 1 Dutch.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR
(Institute of Chemical Physics of the AS USSR)

SUBMITTED: January 18, 1960

Card 3/3

S/190/60/002/010/009/026
B004/B054

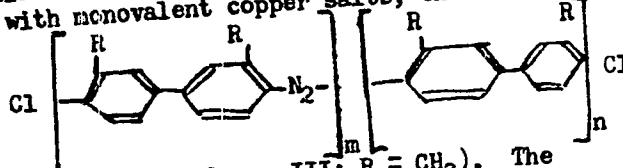
5.3830

AUTHORS: Liogon'kiy, B. I., Lyubchenko, L. S., Berlin, A. A.,
Elyumenfel'd, L. A., and Parini, V. P.

TITLE: Polymers With Conjugate Bonds and Heteroatoms in the Con-
junction Chain. XI. The Spectra of Electron Paramagnetic
Resonance of Linear Aromatic Polymers

PERIODICAL: Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 10,
pp. 1494-1499

TEXT: In previous papers (Refs. 1, 2), the authors obtained aromatic
polymers by reaction of bis-diazotized benzidine, benzidine-3,3'-dicarb-
oxylic acid, and o-toluidine with monovalent copper salts; the following
structural formula is given:



(polymer I: R = H; polymer II: R = COOH; polymer III: R = CH₃). The
electron paramagnetic spectra (epr) were taken (Figs. 1-3) of these poly-

Card 1/2

Polymers With Conjugate Bonds and Heteroatoms in
the Conjunction Chain. XI. The Spectra of Elec-
tron Paramagnetic Resonance of Linear Aromatic
Polymers

S/190/60/002/010/009/026
B004/B054

mers and the copolymer from I and p-diethinyl benzene, and the concentra-
tion of the nonpaired electrons was found to be $10^{18} - 10^{19}$ in 1 g of
substance (Table) by comparison with the epr spectrum of diphenyl-picryl
hydracyl as a standard. All epr spectra showed a signal with g-factor
2.00 which remains unchanged on heating to $300-350^{\circ}\text{C}$ and cooling to 77°K ,
and is interpreted as a signal of the conjugate bonds. The broader epr
signal, which is superposed to this signal in unheated samples, could not
be analyzed because of the superposition, and is interpreted as a signal
of less active, free radicals with localized free valency. The signal ap-
pearing additionally in the insoluble fraction with g-factor 2.05, which
disappears on dissolution, is ascribed to low-molecular particles. The
stability of the epr spectrum in the wide temperature range indicates the
paramagnetic character of at least part of the polymer. There are 3 figures,
1 table, and 9 references: 8 Soviet, and 1 US.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical
Physics of the AS USSR)

SUBMITTED: April 25, 1960

Card 2/2

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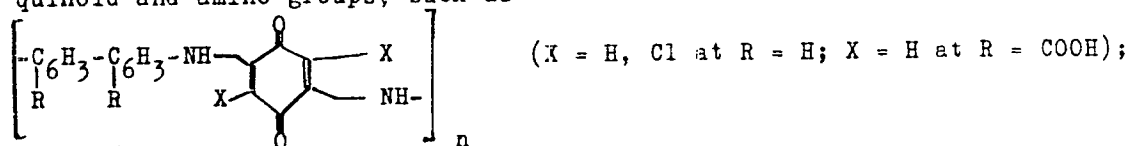
S/020/60/134/005/019/023
B004/B064

AUTHORS: Balabanov, Ye. I., Berlin, A. A., Parini, V. P.,
Tal'roze, V. L., Frankevich, Ye. L., and Cherkashin, M. I.

TITLE: Electrical Conductivity of Polymers With Conjugated Bonds

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 134, No. 5,
pp. 1123-1126

TEXT: To investigate the electrical conductivity σ and its temperature dependence, the authors synthesized the following polymers: 1) Polymers with a noncyclic conjugated chain, such as polyphenyl acetylene and its copolymers with hexine or paradiethynyl benzene; 2) polymers with benzene rings in the conjugation chain, such as polyphenylene, polyphenylene diazo compounds, polymeric-aromatic and aliphatic-aromatic compounds with quinoid and amino groups, such as



Card 1/4

84831

Electrical Conductivity of Polymers With
Conjugated Bonds

S/020/60/134/005/019/023
B004/B064

poly-p-phenylenediamino quinone, polyhexamethylene diamino quinone;
 polyphenylene azoquinone; a polymeric triazene $[-C_6H_4-C_6H_4-NH-N=N-]_n$
 and a substance (16) with a quinoimine group $[-C_6H_4-N=C_6H_4=N-]_n$; polymeric
 chelate compounds of polydiphenyl aminoquinone with metals (e.g. Cu);
 molecular complexes of acenaphthene with chloranil, and with a pyridonium
 derivative of polyphenylene aminoquinone; 3) chelate compounds, such as tetra-
 salicyl ferrocene and its polymeric chelate complexes with Fe^{2+} (21) and Be^{2+} (22); polymeric chelate complexes of percyanoethylene
 with Cu^{2+} and Fe^{2+} . In all compounds, σ rose with temperature according
 to the equation $\sigma = \sigma_0 \exp(-E/kT)$. σ_0 and E are constants characteristic
 of each compound (Table 1). E varied from 4.6 kcal/mole (substance 16)
 to 49.5 kcal/mole for polyphenyl acetylene, and reached 92 kcal/mole in
 the complex compound of acenaphthene with chloranil. The treatment of the
 sample influences σ_0 and E. If the polyphenyl acetylene film obtained from
 the solution is pressed into tablets at 200°C, σ_0 decreases by 22 orders

Card 2/4

84831

Electrical Conductivity of Polymers With
Conjugated Bonds

S/020/60/134/005/019/023
B004/B064

of magnitude. Since, however, E decreases at the same time, σ remains almost constant. (σ_0 ranged from $10^{-12} \text{ohm}^{-1} \cdot \text{cm}^{-1}$ in polyphenylene to $6 \cdot 10^{51} \text{ohm}^{-1} \cdot \text{cm}^{-1}$ in the complex of acenaphthene with chloranil.) This compensation effect was observed in nearly all substances, as may be seen from the function $\log \sigma_0 = f(E)$ (Fig. 1). A change of σ_0 by 60 orders of magnitude and of E by 20 times was observed in substances of different structures. In the substances (16), (21), (22), σ was close to the electrical conductivity of organic semiconductors. In the case of polyphenyl acetylene, which is an insulator at room temperature, σ rises with rising temperature so much that, in consequence of its high σ_0 , the conductivity of many polymers is reached that are conductive already at room temperature. There are 1 figure, 1 table, and 17 references: 14 Soviet, 2 US, and 1 German.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR
(Institute of Chemical Physics of the Academy of Sciences
USSR)

Card 3/4

84831

Electrical Conductivity of Polymers With
Conjugated Bonds

S/020/60/134/005/019/023
B004/B064

PRESENTED: June 14, 1960, by V. N. Kondrat'yev, Academician

SUBMITTED: June 11, 1960

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Card 4/4

S/020/60/135/002/021,036
B016/B052

AUTHOR: Parini, V. P.


TITLE: The Relations Between Some Characteristics of Polynuclear
Aromatic Compounds


PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 135, No. 2,
pp. 335-338

TEXT: The author discusses the distribution of electron density among skeleton-forming atoms of a molecule which consists of condensed aromatic cycles. The electron density (differing from that of benzene) is irregularly distributed among such atoms, and the molecule is therefore easily excitable. The author first discusses the most simple case: aromatic polynuclear hydrocarbons which only consist of six-membered rings. If the double bonds in their structural formulas are arranged such that all electrons are paired, cycles may appear which cannot be represented by the conventional Kekulé benzene cycle structures. The author calls these cycles "non-benzoid cycles". He reports that different

Card 1/3

The Relations Between Some Characteristics
of Polynuclear Aromatic CompoundsS/020/60/135/002/021/036
B016/B052

types of quinoid and triquinoxylidic structures are frequently ascribed to such cycles. The structure of a naphthalene molecule can thus be represented without the quinoid structure; in other words, such a molecule contains no (zero)  non-benzoid cycles. However, the anthracene molecule

 contains a non-benzoid cycle (indicated by x). Benzene holds a special position, since the electron density among its C atoms is regularly distributed. The author states that the excitability of a molecule is related to non-benzoid cycles if double bonds are introduced in its structural formula as described above. This characteristic, however, is largely formal and does not reflect the actual structure of the molecule. Despite its simplicity, the information it gives on some basic properties of polynuclear compounds is sufficient. The coloring of the compounds changes bathochromically as the number of non-benzoid cycles rises from 0 to 4. The absorption maxima are shifted from 200 - 300 m μ to 600 - 700 m μ . At the same time, a tendency toward greater excitability becomes noticeable. Compounds with more than four non-benzoid cycles in their structural formula are so unstable that they have not been

Card 2/3

The Relations Between Some Characteristics of Polynuclear Aromatic Compounds

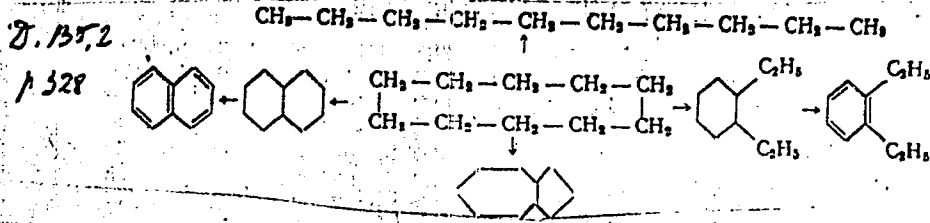
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B016/B052

synthesized so far. The occurrence of structures which only exist in radical state is probable. The author mentions a paper by M. Ye. Dyatkina and Ya. K. Syrkin (Refs. 2,3), but none of his own investigations. There are 1 figure, 1 table, and 9 references: 2 Soviet, 3 US, 4 British, and 1 Japanese.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR (Institute of Chemical Physics of the Academy of Sciences USSR)

PRESENTED: June 23, 1960, by V. N. Kondrat'yev, Academician

SUBMITTED: June 9, 1960



Card 3/3

89989

S/190/61/003/003/004/014
B101/B204

IS-8112

AUTHORS: Parini, V. P., Kazakova, Z. S., Okorokova, M. N.,
Berlin, A. A.

TITLE: Polymers with a system of conjugate bonds and hetero-atoms
in the conjunction chain. XII. Synthesis and properties
of several polyaminoquinones

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 3, 1961,
402-407

TEXT: A. A. Berlin and N. G. Matveyeva (Ref. 1: Vysokomolek. soyed., 1,
1643, 1959) described the formation of polyaminochloroquinones by reac-
tions between diamines and chloranil. These compounds have a positive
magnetic susceptibility and the properties of electron exchangers. The
present paper describes a study of the formation of polyaminoquinones by
means of reactions between diamines and non-substituted quinones. The
reactions were made with p-phenylene diamine (reaction product I),
benzidine (II), benzidine-3-3'-dicarboxylic acid (III), and hexamethylene
diamine. The diamines dissolved in alcohol or the acid dissolved in

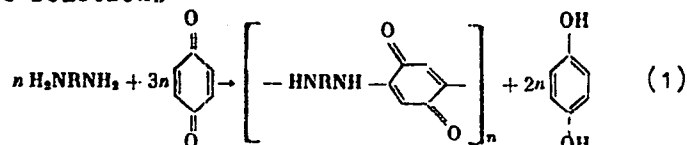
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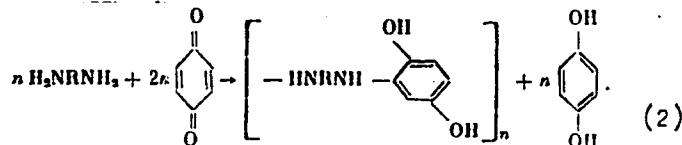
Polymers with a system...

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B101/B204

aqueous-alcoholic solution of NaOH were added to boiling quinone. The resulting precipitate was filtered off after 24 hr, treated for several times with hot alcohol, 5% NaOH, and 5% HCl, and was finally rinsed with water, alcohol, and ether. On the basis of the polymer yield and of the quantities of hydroquinones that had formed, it was concluded that only the first of the two possible reactions



and



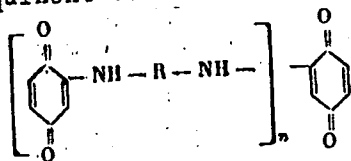
takes place, and that it is not affected by excess diamine. Therefore, further experiments were made with a ratio diamine/quinone = 1/3. On the Card 2/6

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B101/B204

Polymers with a system...

basis of data from elementary analysis and of the chemical behavior of the polymers which indicates quinone terminal groups, the following formula is assumed:



where $R = (\text{CH}_2)_6$; C_6H_4 ; C_{12}H_8 ; $\text{C}_{12}\text{H}_6(\text{COOH})_2$. A degree of polymerization of 5 - 10, and thus a molecular weight of 1000 - 3000 followed from the ratio N/C. The substances I - III are dark brown powders. They form blue or violet solutions in concentrated H_2SO_4 and are partially soluble in quinoline, and only slightly soluble in other organic solvents. III gives a brown solution in dimethyl formamide and alkali. Hard films were obtained from this solution. III dissolved in dimethyl formamide forms a black precipitate with copper acetate which probably has a cross-linked chelate structure. Benzidine dicarboxylic acid dissolved in dimethyl formamide

Card 3/6

89989

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B101/B204

Polymers with a system...

was caused to react with quinone in order to obtain polymers of higher molecular weight. The result were black substances. The reduced viscosity of III dissolved in dimethyl formamide showed an anomaly. (Fig. 1). The substances I - III have electron exchanger properties. They may be partially reduced and are oxidized again by atmospheric oxygen. The fact that they can be reduced only difficultly, and the epr spectrum observed lead to the conclusion that the conjunction of the bonds is not interrupted by the imino group between the benzene rings. These substances have a positive magnetic susceptibility, are highly refractory (loss in weight after 1 hr of heating at 350°C 10.5 - 11%, after one further hour at 450°C about 5%), and are not combustible. Their conductivity obeys the law for semiconductors: $\sigma = \sigma_0 \exp(-E/kT)$. The following was found:

found:	Polymer	E, ev	$\sigma_0, \text{ohm}^{-1} \cdot \text{cm}^{-1}$	$\sigma_{200}, \text{ohm}^{-1} \cdot \text{cm}^{-1}$
	I	0.9	30	10 ⁻¹⁵
	II	1.0	30	10 ⁻¹⁶
	III	0.4	2.10 ⁻³	10 ⁻¹⁰

According to these data, III has semiconductor properties. The possibility of a partial semiquinone structure is discussed. The reaction product
Card 4/6

89989

Polymers with a system...

S/190/61/003/003/004/014
B101/B204

of quinone and hexamethylene diamine, a brown, elastic, easily combustible substance, was not examined in detail. There are 2 figures, 3 tables, and 10 references: 6 Soviet-bloc and 4 non-Soviet-bloc. The 3 references to English-language publications read as follows: H. G. Cassidy, J. Amer. Chem. Soc., 71, 402, 1949; H. G. Cassidy, J. H. Updergraff, *ibid.* 71, 407, 1949; D. Bijl, H. Kainer, A. C. Rose-Innes, *Nature*, 174, 830, 1954.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR
(Institute of Chemical Physics, AS USSR).
Vsesoyuznyy zaochnyy institut tekstil'noy i legkoy
promyshlennosti (All-Union Correspondence Institute of
Textile and Light Industry)

SUBMITTED: July 5, 1960

Card 5/6

Polymers with a system...

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Legend to Fig. 1:
a) g/100 ml

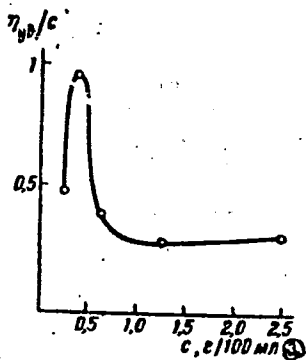


Fig. 1

Card 6/6

28178

S/190/61/003/010/007/019
B124/B110

11.2215 also 2209
AUTHORS: Berlin, A. A., Liogon'kiy, B. I., Parini, V. P.

TITLE: Aromatic polytriazenes

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 10, 1961,
1491 - 1494

TEXT: The present paper deals with the synthesis and study of aromatic polytriazenes of the composition $-\left[\text{---} \text{C}_6\text{H}_4 \text{---} \text{C}_6\text{H}_4 \text{---} \text{N}=\text{N}-\text{NH} \right]_n \text{---} \text{C}_6\text{H}_4 \text{---} \text{C}_6\text{H}_4 \text{---}$ the diazoamino group of which is between benzene rings and characterized by high proton mobility. The compounds studied were synthesized by reaction of bis-diazonium salts with diamines in the presence of sodium acetate: $n\text{ClN}_2 \text{---} \text{R} \text{---} \text{N}_2\text{Cl} + n\text{H}_2\text{N} \text{---} \text{R} \text{---} \text{NH}_2 \xrightarrow[\text{-HCl}]{\text{CH}_3\text{COONa}} \text{---} \text{Cl} \text{---} \left[\text{---} \text{R} \text{---} \text{N} \text{---} \text{N} \text{---} \text{NH} \text{---} \right]_{2n-1} \text{---} \text{R} \text{---} \text{NH}_2$. A bis-diazonium salt solution was added dropwise under intensive mixing to the aqueous-alcoholic solution of benzidine and sodium acetate cooled down to 0°C, and the reaction was carried out in argon current. The yield was 92.5% referring to the fundamental unit of

Card 1/4

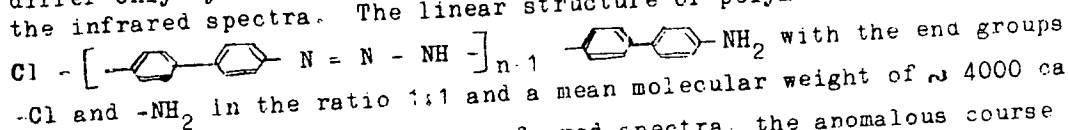
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B124/B110

Aromatic polytriazenes

polymer. The polymer is a brick-red powder partly soluble in aniline, acetone, benzene, dioxane, pyridine, acetic anhydride, and quinoline, and entirely soluble in dimethyl formamide, concentrated H₂SO₄, and formic acid at room temperature. When heated, the polymer is also completely soluble in pyridine and quinoline. Extraction yielded two fractions, one soluble in acetone (36%), one insoluble in acetone (64%), the latter being soluble in dimethyl formamide. When the polymer is heated in argon, no loss in weight occurs up to 100°C. The loss in weight is 5.2% at 150°C, and 20.2% at 200°C. It was found that heating did not cause a progressive polymer decomposition; because the loss in weight did not surpass a certain limit for any temperature. The infrared spectra of the two fractions differ only by their absorption intensity. Another paper will describe the infrared spectra. The linear structure of polymer



be assumed on the basis of the infrared spectra, the anomalous course of viscosity curves (see Fig. 2), and the results of elementary analysis.

Card 2/4

Aromatic polytriazenes

28178
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B124/B110

The anomalous course of viscosity curves proves the rigidity of polymer molecules and their tendency toward association. The epr spectra of aromatic polytriazenes are 7 - 8 oe wide symmetrical singlets with rather high intensity with the g-factor of free electron and superposition of a 30 - 40 oe wide signal with the same g-factor. The total concentration of paramagnetic particles of the unfractionated polymer and the polymer soluble in acetone fluctuated in the order of 10^{19} . Cooling down to 77°K does not change the character of the epr signal; its intensity rises, however, according to the Curie law. The epr spectra prove that the conjunction along the chain is preserved and unpaired electrons in basic

state are present. Magnetic susceptibility was $0.55 \cdot 10^{-6}$ per gram. The aromatic polytriazenes are electrical insulators at room temperature; electrical conductivity rises, however, considerably with temperature.

$E = 1$ ev, $\sigma_0 \sim 50 \text{ ohm}^{-1} \cdot \text{cm}^{-1}$ at room temperature; $E = 1.3$ ev,

$\sigma_0 \sim 6 \cdot 10^6 \text{ ohm}^{-1} \cdot \text{cm}^{-1}$ at 200°C was found for the values of equation

$\sigma = \sigma_0 \exp(E/kT)$. There are 3 figures and 9 references: 7 Soviet and 2

non-Soviet. The two references to English-language publications read as follows: C. Marwel, G. Hartzell, J. Amer. Chem. Soc., 81, 448, 1959; ~~1/1~~

Card 3/4

Aromatic polytriazenes

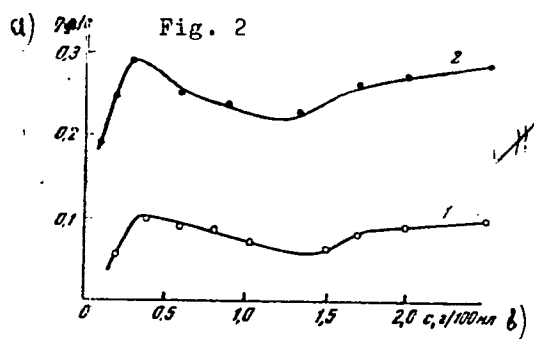
28-78
S/190/61/003/010/007/019
B124/B110

J. E. Stewart, M. Hellman, J. Res. Nat. Bur. Standards, 50, 125, 1958.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics AS USSR)

SUBMITTED: November 14, 1960

Fig. 2. Dependence of intrinsic viscosity of the solutions of aromatic polytriazenes on the concentration (solvent: dimethyl formamide, Ubbelohde viscosimeter, temperature $20 \pm 0.02^\circ\text{C}$). (1) Fraction of polymer soluble in acetone; (2) fraction insoluble in acetone

Legend: (a) η_{intr}/c ; (b) c , g/100 ml.

Card 4/4

S/190/61/003/012/012/012
B110/B147

AUTHORS: Parini, V. P., Kazakova, Z. S., Berlin, A. A.

TITLE: Polymers with conjugate bonds and heteroatoms in the conjugate chain. XIX. Some properties of aniline black

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 12, 1961, 1870 - 1873

TEXT: The formulas for aniline black by A. G. Green (Ber., 46, 33, 1913) have been doubted by I. S. Ioffe and Ye. M. Metrikina (Ref. 2: ZhRFKhO, 62, 1101, 1115). Aniline black probably consists of polymers or oligomers with repeated quinone diimine groupings. V. P. Parini found a connection between the energy of the lowest unfilled level, the activation energy of conductivity, and other properties of aromatics having a benzene ring and accumulation of quinoid rings in the molecule. In quinone diimine groupings with nitrogen atoms unsaturated with respect to coordination, the molecule should be excited even more easily. According to

Card 1/5

Polymers with conjugate bonds ...

S/190/61/003/012/012/012
B110/B147

A. G. Green and W. Johnson, 16 g of aniline, 48 milliliters of 31% HCl were dissolved in 200 milliliters of H₂O, and mixed with a solution of 24 g of K₂Cr₂O₇ in 600 milliliters of H₂O. After 1 hr, this solution was heated to 70°C and sucked off. The lye was obtained by boiling with NH₃. The complex-bound chromium was removed by treating with HCl (1.19) at 40 and 80°C, dissociating of hydrochloride by aqueous NH₃, dissolving in acetic acid, and washing with 2% NaCl solution. The authors found 14.22% of N in the lye (Green: 13.85%). In hydrochloride, they found 12.90% of N and 6.83% of Cl, which well agreed with Green's data. The results, however, contradicted the formula for aniline black given in the literature. The authors studied: (1) the substance obtained at first and not extracted with alcohol; (2) Cr-containing hydrochloride obtained after alcoholic extraction; (3) the corresponding lye; (4) the hydrochloride obtained after Cr removal and reprecipitation from acetic acid; (5) the lye obtained therefrom. The magnetic properties were examined by X-ray spectroscopy (wavelength = 3.2 cm). All samples showed a wide epr line (~450 oersteds)

Card 2/5

Polymers with conjugate bonds ...

S/190/61/003/012/012/012
B110/B147

corresponding to the epr spectrum of chromium oxide. This epr line had a narrow singlet (11 - 13 oersteds) having a g-factor of 2.00 and an integral intensity of $10^{19} - 10^{20}$ paramagnetic particles per 1 gram. Paramagnetic absorption decreased somewhat with Cr removal by HCl. After several hours' heating at 200°C , the wide line vanished in all samples, which proves its dependence on structure. The narrow epr signal was observed several times in conjugated bonds. Between 20 and 80°C , the electrical conductivity is subject to the equation for semiconductors, $\sigma = \sigma_0 \cdot \exp(-E/kT)$ (Table). In hydrochloride, it is essentially higher. At normal temperature and with a steep course of the curve $\sigma = f(T)$, low E and σ_0 values lead to conductivities comparatively high for organic substances. At 40°C , the sample not purified from low-molecular fractions by alcoholic extraction showed a salient point of the conductivity-versus-temperature curve and a sharp drop of activation energy and rise in conductivity. Catalytic activity was concluded from the magnetic and semiconductor properties. All samples, especially the hydrochlorides and the Cr-containing samples, catalyzed the

Card 3/5

Polymers with conjugate bonds ...

S/190/61/003/012/012/012
B110/B147

Table. Electrical conductivity of various aniline-black samples.
Legend: (1) substance; (2) initial substance before alcoholic extraction; (3) Cr-containing lye; (4) the same, hydrochloride; (5) lye after Cr removal; (6) in the range of; (7) at.

Электропроводность различных образцов АЧ

① Вещество	κ, ohm ⁻¹ см ⁻¹	κ _с , ohm ⁻¹ см ⁻¹	κ _{300°K} , ohm ⁻¹ см ⁻¹
② Первоначальное вещество до экстракции спиртом	0,45* 0,20**	10 ² 101,5**	10 ⁻³ 10 ^{-1,5***}
③ Хромсодержащий АЧ, основанье	0,81	100,9	10 ⁻¹²
④ То же, хлоргидрат	0,35	10 ⁻²	10 ⁻³
⑤ По удалению хрома, основанье	0,61	10 ^{-1,6}	10 ⁻¹²
⑥ То же, хлоргидрат	0,17	10 ^{-2,2}	10 ⁻³

* В интервале 20-40°. ** В интервале 40-60°. *** При 350°K.

Card 5/5

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A. 8000

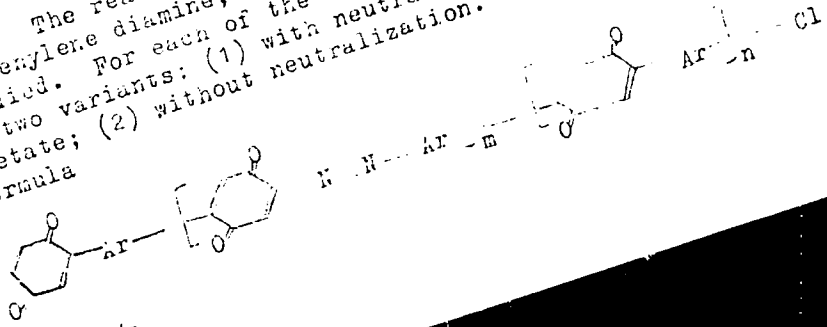
AUTHORS:

Parini, V. P., Kazakova, Z. S., Okorokova, M. N., Berlin, A.A.
Polymers with conjugate bonds and heteroatoms in the conjugate chain. XXII. Products of the reaction of bis-diazo compounds with quinones

S/190/62/004/004/005/019
B119/B138

PERIODICAL: Vysokomolekulyarnyye soedineniya, v. 4, no. 4, 1961, 510-515

TEXT: The reaction of p-benzoquinone with bis-diazo compounds of p-phenylene diamine, benzidine, and benzidine-3,3'-dicarboxylic acid was studied. For each of the two latter compounds the reaction was conducted in two variants: (1) with neutralization of the released HCl by sodium acetate; (2) without neutralization. Five polymers of the proposed general formula

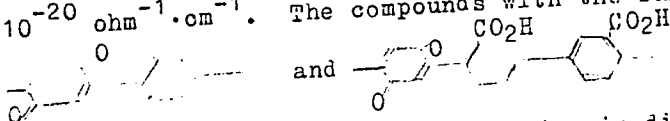


Card 1/3

S/190/62/004/004/005/019
B119/B138

Polymers with conjugate bonds and ...

were obtained (Ar is the aromatic group corresponding to the initial product). The compounds contain 5-15 benzene nuclei per molecule (estimated molecular weight 500-1500). The nitrogen content of the polymers, which depends on the acidity of the reaction medium, is 0.55 (with neutralization) to 11.6%. The compounds are heat resistant (3% loss of weight at 300°C) have electron exchange properties, and emit epr signals with an integral intensity of around 10^{18} - 10^{20} paramagnetic particles per gram. At 25°C the electrical conductivity is 10^{-10} to 10^{-20} ohm⁻¹.cm⁻¹. The compounds with the fundamental molecules



react with heavy metal salts (solution in dimethyl formamide) to give insoluble compounds, probably with formation of cross-linked chelate structures. There are 1 figure and 2 tables. The most important English-language reference is: D. E. Kvalnes, J. Amer. Chem. Soc., 56, 2478, 1934.

Card 2/3

37430

S/190/62/004/005/006/026
B110/B144

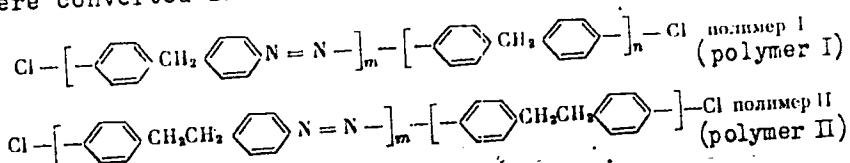
15.8540

AUTHORS: Berlin, A. A., Liogon'kiy, B. I., Parini, V. P., Leykina, M. S.

TITLE: Polymers with conjugate bonds and a heteroatom in the conjugate chain. XXIV. Synthesis and study of the properties of linear aromatic polymers with methylene groups between the benzene rings

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 5, 1962, 662-669

TEXT: Bis-diazotized 4,4'-diamino-diphenyl methane and 4,4'-diamino-dibenzyl were converted into the linear polymers



Card 1/3

Polymers with conjugate bonds ...

S/190/62/004/005/006/026
B110/B144

by an ammoniacal solution of univalent copper in Ar atmosphere at 0°C. They were light-brown powders insoluble in ordinary organic substances, soluble in benzene, pyridine, quinoline, and dimethyl formamide, with the molecular weights $\bar{M}_{pI} = 1250$ and $\bar{M}_{pII} = 2600$. The almost normal viscosity proves the macromolecular chain to be very flexible. The molecular weight of II is higher, since the two methylene groups between the benzene rings (1) reduce the electron dislocation, and (2) effect a slower decrease of the radical activity on recombination. The slight loss in weight when heating after evacuation is based on: (1) distillation or decomposition of low-molecular impurities, and (2) inhibition of the decomposition of the high-molecular product. The epr spectra of I and II show two signals with the g-factors 2.00 (a) and 2.06 (b), respectively, where a consists of a narrow signal (6-8 oersteds) and a wide signal (50 oersteds) which is caused by the poorly active, free radicals remaining in the polymer. b is a triplet (25 oersteds) caused by low-molecular biradicals. The decrease of the degree of conjugation in the polymer chain is explained by a decrease in integral concentration of paramagnetic particles per g of substance and by the intensity of the

Card 2/3

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Polymers with conjugate bonds ...

narrow signal as compared to polyazopherylenes: Measurement of the electrical conductivity yielded for I: $E = 1.7 \text{ ev}$, $\sigma_0 = 10^{12} \text{ ohm}^{-1} \cdot \text{cm}^{-1}$, $\sigma_{300^\circ\text{K}} = 10^{-16} \text{ ohm}^{-1} \cdot \text{cm}^{-1}$, $\sigma_{600^\circ\text{K}} = 10^{-2} \text{ ohm}^{-1} \cdot \text{cm}^{-1}$. For II, $\log \sigma = f(1/T) - 1/2$ as the temperature rose.

Introduction of one or two CH_2 or NH groups thus causes a steep increase in the temperature dependence of the conductivity. The conductivity of these polymers will be high at high temperatures owing to the considerable heat resistance of I and II at 300-350°C. There are 3 figures and 4 tables.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics AS USSR)

SUBMITTED: March 23, 1961

Card 3/3

5.3832

39851

S/190/62/004/008/012/016
B101/B138

AUTHORS: Liogon'kiy, B. I., Moshkovskiy, Yu. Sh., Parini, V. P.,
Berlin, A. A.

TITLE: Infrared spectra of some aromatic polymers

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 8, 1962,
1241-1248

TEXT: The IR spectra of the following linear polymers synthesized previously (see Vysokomolek. soyed., 2, 689, 1494, 1960; 3, 1491, 1961; 4, 662, 1962), were examined in order to ascertain their structure:

$\text{Cl}-\left[\begin{array}{c} \text{C}_6\text{H}_5 \\ | \\ \text{R} \end{array} - \text{C}_6\text{H}_5 \right]_m - \left[\begin{array}{c} \text{N}=\text{N} \\ | \quad | \\ \text{R} \quad \text{R} \end{array} - \text{C}_6\text{H}_5 - \text{C}_6\text{H}_5 \right]_n - \text{Cl}$, where R = H (I), $\cdot\text{CH}_3$ (II), or

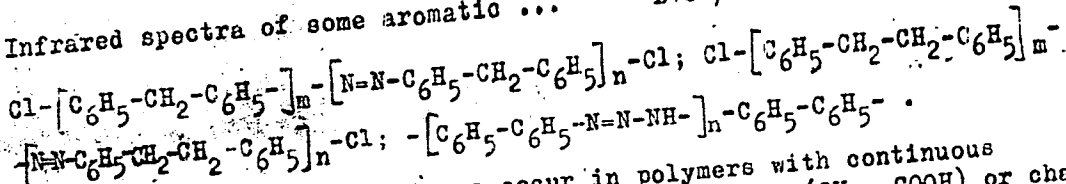
COOH (III); a block-copolymer of I with p-diethynyl benzene, the copper chelate compound of III; $\text{F}-\left[\text{C}_6\text{H}_5 - \text{C}_6\text{H}_5 \right]_m - \left[\text{N}=\text{N} - \text{C}_6\text{H}_5 - \text{C}_6\text{H}_5 \right]_n - \text{F}$;

$-\left[\text{C}_6\text{H}_5 - \text{C}_6\text{H}_5 \right]_m - \left[\text{N}=\text{N} - \text{C}_6\text{H}_5 - \text{C}_6\text{H}_5 \right]_n -$ with $-\text{O}-\text{CO}-\text{CH}_3$ or OH groups at the end;

Card 1/3

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B101/B138

Infrared spectra of some aromatic ...



Results: (1) Quinoid structures occur in polymers with continuous conjugate chains. The introduction of substituents (CH₃, COOH) or chain links (-CH₂-, -CH₂-CH₂-, -N=N-NH-) disturbs the coplanarity of the molecule and reduces the proportion of quinoid structures. (2) In polymers the ionization of the carboxyl groups increases with molecular weight. (3) The formation of a three-dimensional structure with a continuous system of conjugated bonds is characterized by a continuous background in the whole spectral region studied, and by the absence of noticeable absorption bands. There are 3 figures. The most important English-language references are I.E. Stewart, M. Hellmann, J. Res. Nat. Bur. Standards, 60, 125, 1958; K. Ueno, J. Amer. Chem. Soc., 79, 3805, 1957; K. S. Tetlow, Research, 3, 187, 1950.

X

Card 2/3

PARINI, V.P.

Organic complexes with electron transfer. Usp.khim. 31 no.7:
822-837 J1 '62. (MIRA 15:8)

1. Institut khimicheskoy fiziki AN SSSR.
(Organic compounds)
(Chemistry, Physical and theoretical)

ACCESSION NR: AT4033997

S/0000/63/000/000/0134/0138

AUTHOR: Berlin, A. A.; Liogon'kiy, B. I.; Parini, V. P.

TITLE: Synthesis and properties of a polymer from 4,4'-biphenylbisdiazonium tetrafluoroborate

SOURCE: Geterotsepnny*ye vy*sokomolekulyarny*ye soyedineniya (Heterochain macromolecular compounds); sbornik statey. Moscow, Izd-vo "Nauka," 1963, 134-138

TOPIC TAGS: polymer, aromatic polymer, polyazophenylene, fluorine containing polymer, polymer synthesis, heat resistant polymer, organic semiconductor, semiconducting polymer

ABSTRACT: Aromatic polymers (polyazophenylenes) (I) with an average molecular weight up to 4,000 or 4,500 were synthesized by reduction of 4,4'-biphenylbisdiazonium tetrafluoroborate with monovalent copper salts. The resultant polymers were in the form of dark cinnamon powders, showed significant thermal stability (retaining a glassy state even at 450C) and lost less than 10% of their initial weight at 500C in an inert atmosphere. Similarly to polymers synthesized earlier from the bisdiazonium chloride (II), the fluorine-containing polymers (I) had phenylene and azo groups. Infrared analysis, viscosimetric measurements and thermomechanical tests indicated that the length of polymer molecules with conjugated

Cord 1/2

ACCESSION NR: AT4033997

bonds is greater in I than in II. I produced EPR signals of higher intensity than II and exhibited higher magnetic susceptibility ($\chi \cdot 10^{-6} = 1.4$ CGSM at $H = 3500$ oersteds, as compared to 0.17-0.20 CGSM). Electrical conductivity obeyed an exponential law and ranged from $10^{15} \text{ ohm}^{-1} \cdot \text{cm}^{-1}$ at room temperature to 10^{-11} at 125C. Orig. art. has: 5 figures.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical Physics AN SSSR)

SUBMITTED: 10Sep62

ENCL: 00

SUB CODE: OC, MT

NO REF SOV: 010

OTHER: 002

Card 2/2

PARINI, V.P.; SIMONOV, A.M.; FRANEVICH, Ye.L.; CHUB, N.K.

Electrophysical properties of some aromatic betaines. Izv.AN
SSSR,Otd.khim.nauk no.3:446-450 Mr '63. (MIRA 16:4)

1. Institut khimicheskoy fiziki AN SSSR i Rostovskiy-na-Donu
gosudarstvennyy universitet.
(Betaine)

PARINI, V.P.

Organic complexes with load transfer. Analele chimie 18 no.2:43-62
Ap-Je '63.

PARINI, Vladimir Pavlovich; KAZAKOVA, Zoya Semenovna; BELEN'KIY,
L.I., doktor tekhn. nauk, otv. red.

[Chemical palette] Palitra khimii. Moskva, Izd-vo "Nauka,"
1964. 126 p. (MIRA 17:7)

PARINI, V.P.; FRANKEVICH, Ye.L.; DEYCHEYSTER, M.V.

Electrophysical characteristics of some hemioxanines. Izv. AN
SSSR. Ser.khim. no.3:576-578 Mr '64. (MIRA 17:4)

1. Institut khimicheskoy fiziki AN SSSR.

ACCESSION NR: AP4033387

S/0062/64/000/004/0705/0709

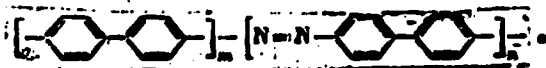
AUTHOR: Berlin, A. A.; Liogon'kiy, B. I.; Parin, V. P.

TITLE: Polymers with a conjugated system. Communication 56. Synthesis and study of the properties of a polymer based on bis(nitrosoacetyl)benzidine

SOURCE: AN SSSR. Izvestiya. Seriya khimicheskaya, no. 4, 1964, 705-709

TOPIC TAGS: organic semiconductor, semiconducting polymer, polyazophenylene, polyazophenylene preparation

ABSTRACT: A polymer containing aromatic rings and azo groups in the backbone has been prepared by the decomposition of N,N'-dinitroso-N,N'-diacetylbenzidine in benzene:



Card 1/3

ACCESSION NR: AP4033387

The reaction was carried out under argon at 40—45C for 4 hr, then at the boiling point of benzene for 4 more hr; nitrogen evolved and the polymer precipitated. The polymer is partly soluble in aniline, pyridine, quinoline, and dimethylformamide, and is completely soluble in concentrated sulfuric acid. Decomposition in air begins at 500C. IR and EPR spectra, concentration dependence of reduced viscosity in 98Z H₂SO₄, magnetic susceptibility, and thermomechanical curves were measured, and thermogravimetric analysis was performed for the polymer and compared with similar data for polyazophenylene prepared by reduction of 4,4'-biphenylbis(diazonium chloride) with cuprous salts. The fact that the new polymer prepared in the absence of metal showed an EPR signal and paramagnetism was regarded as confirming that these effects are due not to the presence of impurities but to the formation during the synthesis of a homologous polymer fraction of stable biradicals and charge transfer complexes. The temperature dependence of electrical conductivity obeyed an exponential law; σ_0 equals $10^{-3} \text{ ohm}^{-1} \cdot \text{cm}^{-1}$, E equals 1.01 ev. At 125C, the electrical conductivity is $10^{-10} \text{ ohm}^{-1} \cdot \text{cm}^{-1}$. Orig. art. has: 3 figures and 3 formulas.

ASSOCIATION: Institut khimicheskoy fiziki, Akademii nauk SSSR (Institute of Chemical Physics, Academy of Sciences, SSSR)

Card 2/3

ACCESSION NR: AP4033387

SUBMITTED: 16Oct62

DATE ACQ: 15May64

ENCL: 00

SUB CODE: CH, PH

NO REF SOV: 007

OTHER: 005

Cord 3/3