

TOKAREV, A.A.

The Chausson city motorbus. Avt. 1 trakt. prom. no.2:45-47 F '57.  
(MLRA 10:3)

1. Moskovskiy avtozavod imeni Likhacheva.  
(France--Motorbuses)

GOL'BREYKH, A.A.; TOKAREV, A.A.

Effect of the viscosity on the selection of working fluids for hydraulic transmissions. Avt.prom. no.10:23-26 0 '58.

(MIRA 11:11)

1. Moskovskiy avtozavod imeni Likhacheva.  
(Oil hydraulic machinery) (Automobiles--Transmission devices)

TOKAREV, A.A.; GOL'BREYKH, A.A.

Hydraulic torque converter for motorbuses. Avt. i trakt. prom. no.9:  
7-12 S '56. (MIRA 9:11)

1. Moskovskiy avtozavod imeni I. A. Likhacheva.  
(Motorbuses--Transmission devices)

TOKAREY, A.A.

Evaluating dynamic properties of urban buses. Avt.prom. no.11:23-  
26 N '60. (MIRA 13:11)

1. Gosudarstvennyy soyuznyy ordena Trudovogo Krasnogo Znameni  
nauchno-issledovatel'skiy avtomobil'nyy i avtomotorny institut.  
(Motorbuses--Dynamics)

TOKAREV, A.A.

Evaluating the economy of fuel on city motorbuses. Avt.prom.  
no.3:24-28 Mr '61. (MIRA 14:3)

1. Gosudarstvennyy soyuznyy ordena Trudovogo Krashogo Znameni  
nauchno-issledovatel'skiy avtomobil'nyy i avtomotornyy institut.  
(Motorbuses)

BEREZHIINSKIY, V.G.; TOKAREV, A.F.

Automatic unit for the assembly of electrode-plate blocks of  
alkaline batteries. Biul.tekh.-ekon.inform. Gos.nauch.-issl.  
inst.nauch. i tekh.inform. 16 no.5:42-43'63. (MIRA 16:7)  
(Electric batteries)

ISAKHANYAN, N. T.; TOKAREV, A. I.; GONCHAROV, P. A.

Effect of the composition of molding sand mixtures on the probability of the formation of shrinkage cavities. *Izv. vys. ucheb.zav.; chern.met.7* no. 5:147-153 '64. (MIRA 17:5)

1. Moskovskiy institut stali i splavov.

TOKAREV, A.I.

Conditions favorable to the occurrence of shrinkage cavities in castings. Izv. vys. ucheb. zav.; chern. met. 7 no.3:193-200 '64. (MIRA 17:4)

1. Moskovskiy institut stali i splavov.



TOKAREV, Aleksandr Ivanovich; SHELYDERMAN, K.A., red.

[Toward the third goal]K tret'emu rubeniu. Rostov-na-Donu. Rostovskoe knizhnoe iza-vo, 1963. 11 p.

(KIP 7:10)

1. Direktor sovkhoz "Udarnik, zavod'skogo proizvodstvennogo upravleniya, Rostovskoy oblasti (for Tokarev).

TOKAREV, A.I.

Balancing of a solid rotating about a fixed point. Trudy Inst.  
mash. Sem. po teor. mash. 19 no.73:39-47 '59. (MIRA 13:3)  
(Mechanical movements)

TOKAREV, A.K.

Vibration boring in river beds. Avt. dor. 22 no.9:24-25 S '59.  
(MIRA 12:12)

(Boring) (Bridge construction)

TOKAREV, A.K., inzh.

Using electric geophysical exploration in road surveying.

Avt. dor. 21 no.5:13-15 My '58.

(MIRA 11:6)

(Road--Surveying) (Prospecting--Geophysical methods)

TOKAREV, A.K., inzh.

Electric exploration of water supply resources by using new  
apparatus. Vod. i san. tekhn. no.6:23-27 Je '65.

(MIRA 18:8)

TOKAREV, A.K., inzh.

Using electrometric methods in exploring and prospecting for  
deposits of road materials. Avt.dor. 21 no.10:18-20 0 '58.  
(Road materials) (Electric measurements) (MIRA 11:11)

1. GKAREV, A.K.

KRAVTSOV, N.D.

PHASE I BOOK REPRODUCTION 807/1637

Академия наук СССР. Комплексная антарктическая экспедиция.

Описание экспедиции на дизель-электрической "Об", 1955-1956 гг. (Description of the Expedition aboard the Diesel-electric Ship "Ob", 1955-1956) Moscow, Izdatvo AN SSSR, 1958. 237 p. 2,000 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Soviet Antarctic Expedition (Isledovaniya). Chief Ed.: I. P. Bardin, Academician Resp. Ed. for this vol.: V.G. Kort, Professor, Chief, 1st trip of the Marine Antarctic Expedition, USSR Academy of Sciences; Editorial Board: A.A. Afanas'yev (Chief, Main Administration of the Northern Sea Route, Sea Route, NKP), V.G. Mal'nev (Minister of Sea Transport), V. P. Burdakov (Deputy Chief, Main Administration of the Northern Sea Route), A.A. Zolotarev (Chief, Main Administration of the

Card 1/9

Hydro-meteorological Service), V.G. Kort (Professor, Chief, 1st trip of the Marine Antarctic Expedition, USSR Academy of Sciences; Ed.: M.M. Somov (Chief, Combined Antarctic Expedition, USSR Academy of Sciences); V. V. Frolov (Director, Arctic Scientific Research Institute, Main Administration of the Northern Sea Route), B. I. Zhurav (Chairman, Council for Antarctic Research, USSR Academy of Sciences; Ed.: Publishing House: L.I. Spryngina, and B. S. Shohmet; Tech. Ed.: F. S. Matlina.

PURPOSE: This volume is intended for the general reader.

COVERAGE: The Report of the Combined Antarctic Expedition of the AN SSSR, headed by M. M. Somov, contains an account of the work on the first trip of the Diesel-electric ship "Ob" to the Antarctic and the aims and problems involved, including the establishment of an observatory at Mirny. A major part of the book is devoted to scientific research in serology, meteorology and actinometry.

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conducted in cooperation with the IGY program. A large part of the observations and preliminary findings cited are in the field of hydrology and bacteriology, marine geology, geophysics, hydrography, and hydrobiology.

XI. Biological Studies (V. A. Arsen'yev, K. A. Khodakly, P. V. Ushakov, G. M. Malyayev, A. P. Indiyayev, and A. E. Tolstov (deceased))

Plankton problems and organization of studies 172  
 Plankton (K. A. Khodakly and M. Ye. Vinogradov) 172  
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(A)

SOURCE CODE: UR/0413/66/000/014/0080/0080

INVENTORS: Kudryayevtsev, G. I.; Tokarev, A. V.; Gitis, S. S.; Ivanova, V. M.;  
Seina, Z. N.; Lyubova, T. A.; Nemleva, S. A.

ORG: none

TITLE: A method for obtaining modified polyethyleneterephthalate. Class 39,  
No. 183936 [Announced by All-Union Scientific Research Institute of Synthetic Fibers  
(Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo volokna)]

SOURCE: Izobret prom obraz tov zn, no. 14, 1966, 80

TOPIC TAGS: ~~polymer~~, polyethylene, ~~plastic~~, chemical synthesis

ABSTRACT: This Author Certificate presents a method for obtaining a modified  
polyethylene terephthalate by introducing modifying ingredients in the course of its  
synthesis. To increase the heat resistance of the polymer and of its products,  
the bifunctional derivatives of pyromellitimide (for instance, N,N<sup>1</sup>-(bis-ethoxy)py-  
romellitimide or N,N<sup>1</sup>-bis-acetylpyromellitimide is used as the modifying addendum.

SUB CODE: 11/

SUBM DATE: 02Jul65

Card 1/1



ТОКАРЕВ, А.В., КОСТАВИЧЕВ, С.И.

Synthesis and study of unsaturated fiber-forming polymers.  
Part 1: Synthesis of unsaturated polyamides. *Vysokom. sredn.*  
6 no. 5:850-855 My '64. (1964) 17pt.

1. Vsesoyuznyy nauchno-issledovatel'skiy institut askaniyevskogo  
volokna.

5(4), 15(8)

SOV/76-33-3-8/41

AUTHORS: Tokarev, A. V., Spasskiy, S. S.

TITLE: Co-polymerization of Unsaturated Polyesters With Vinyl Monomers (Sopolimerizatsiya nenasyshchennykh poliefirov s vinilovymi monomerami). II. Determination of the Co-polymerization Constants (II. Opredeleniye konstant sopolimerizatsii)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 3, pp 554 - 558 (USSR)

ABSTRACT: The example of the system poly-1,3-butylenglycolfumarate-styrene (I) serves as proof of the possibility of applying the integral equation according to Mayo and Lewis to the determination of the constants of co-polymerization of unsaturated polyesters together with vinyl derivatives. Co-polymerization was carried out in glass ampoules in a nitrogen atmosphere in the ultrathermostat at  $60 \pm 0.1^\circ\text{C}$  and 0.01% by weight of benzoyl peroxide. A comparison between the polystyrenes obtained and a product (Ref 7) described in publications is given (Table 1). With increasing reaction intensity in polymerization the styrene-content in the co-

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Co-polymerization of Unsaturated Polyesters With Vinyl SOV/76-33-3-8/41  
Monomers. II. Determination of the Co-polymerization Constants

polymer increases somewhat up to a certain extent ( 11-12% by weight). Two different experiments were carried out (Tables 3,4) in order to investigate the reactivity of the co-polymer; it was found that no soluble intermediate products form in this reaction. Only part of the double bonds of the polyester takes part in co-polymerization (Table 2), whereas the other part passes over into the co-polymer without any change, which fact has to be taken into account in connection with the calculation of the co-polymerization constants (CPC) by a corresponding correction. The calculation results of the (CPC) according to the equation by Mayo-Lewis, with the above correction, are in good agreement and are for (I)  $r_1 = 3.0 \pm 0.4$  and  $r_2 = 0.03 \pm 0.03$ .

The values show that the radicals  $M_1^{\cdot}$  of the polyester do more rapidly react with its monomers than with styrene and that the styrene radical  $M_2^{\cdot}$  reacts predominantly with the unsaturated ester chains of the polyester, which is considered to be due to additional steric hindrances. In con-

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Co-polymerization of Unsaturated Polyesters With Vinyl Monomers. II. Determination of the Co-polymerization Constants SOV/76-33-3-8/41

In conclusion the authors thank V. V. Korshak. There are 5 tables, and 7 references, 2 of which are Soviet.

ASSOCIATION: Ural'skiy filial Akademii nauk SSSR (Ural Branch of the Academy of Sciences, USSR)

SUBMITTED: March 6, 1957

Card 3/3

TOKAREV, A.K. (Leningrad)

Vibration boring of shallow wells for water supply. Vod.i san.  
tekh. no.11:6-9 N '62. (MIRA 15:12)  
(Boring) (Water-supply engineering)

TOKAREV, A.K., kand.biol.nauk [deceased]

Some characteristics of the behavior of ocean herring during the  
period of fattening. Trudy Vniro 36:5-18 '58. (MIRA 12:4)  
(Atlantic Ocean--Herring)  
(Fishes--Habits and behaviour)

TOKAREV, A.K., kand.biol.nauk [deceased]

Biological and hydrodynamic sounds uttered by fishes. Trudy VNIRO  
36:272-279 '58. (MIRA 12:4)

(Fishes)

(Sound production by animals)

TOKAREV, A.K., inzh.

Vibrational boring of soils in surveying highways. Avt.dor.  
21 no.3:23-25 Mr '58. (MIRA 11:3)  
(Roads--Surveying) (Boring machinery)



TOKAREV, A. K.

Fisheries

Ways of improving the trade's reconnaissance for fish and marine animals. Ryb. khoz., 28, No. 5, 1952.

9. Monthly List of Russian Accessions, Library of Congress, October 1953<sup>2</sup> Uncl.

TOKAREV, A. K

USSR/ Biology - Zoology

Card 1/1

Pub. 22 - 42/47

Authors : Tokarev, A. K.

Title : ~~Schools of ordinary Caspian sprats~~  
Schools of ordinary Caspian sprats

Periodical : Dok. AN SSSR, 100/6, 1187-1189, Feb 21, 1955

Abstract : Information is presented regarding the basic industrial fish namely, the ordinary Caspian Sea sprats (seasons of the year and areas on the sea where large sprat schools are found). Four USSR references (1937-1948). Graphs; drawing.

Institution : All-Union Scientific Research Institute of Sea Fish Economy and Oceanography.

Presented by: Academician E. N. Pavlovskiy, November 10, 1954

TOKAREV, A.K. (Moskva)

Studying the distribution and behavior of marine commercial fishes  
with the aid of a new location technique. Uch.zap.Kaz.un. 115 no.10:  
71-72 '55. (MLRA 10:5)

(Sonar in fishing)

TOKAREV, A.K., inzh.

Vibration boring of soil when surveying for railroads, Transp.  
stroi. 13 no.5:6-8 My '63. (MIRA 16:7)

(Railroads--Surveying) (Boring)

TOKAREV, A.K.

Boring of the shallow water supply wells by vibrators.  
Khidrotekh i melior 8 no.4:118-119 '63.

~~TOKAREV, Aleksey Nikolayevich; SHCHERBAKOV, Aleksandr Vladimirovich;~~  
~~SHCHEGOLEV, D.I., redaktor; BNTIN, M.L., redaktor izdatel'stva;~~  
POPOV, N.D., tekhnicheskii redaktor

[Radio hydrogeology] Radiogidrogeologiya. Moskva, Gos. nauchno-  
tekh. izd-vo lit-ry po geol. i okhrane nedr, 1956, 262 p.  
(Water, Underground) (Radioactivity) (MIRA 10:3)

AL'TOVSKIY, M.Ye.; CHAPOVSKIY, Ye.G.; BABUSHKIN, V.D.; BINDEMAN,  
N.N.; LAPTEV, F.F.[deceased]; SOKOLOV, I.Yu.; CHALISECHEV,  
A.M.[deceased]; PROKHOROV, S.P.; TOKAREV, A.N.; KOGOTSEV,  
A.P.; ABRAMOV, S.K.; KONOPYANTSEV, A.A., red.; FRIKLONSKIY, V.A.,  
red. deceased]; SPITSYN, N.I., red.; MARINOV, N.A., red.;  
KULICHIKHIN, N.I., red.; GARMONOV, I.V., red.; LYUBCHENKO, Ye.K.,  
red. izd-va; POTAPOV, V.S., red. izd-va; GUROVA, O.A., tekhn.  
red.

[Hydrogeologist's handbook] Spravochnik gidrogeologa. Pod ob-  
shehei red. M.E.AL'tovskogo. Moskva, osteoltekhizdat, 1962.  
615 p. (MIRA 15:7)

(Water, Underground)

TOKAREV, A.N.

AUTHOR: Popov, V.N.

89-10-34/36

TITLE: Review of the Book "Radiohydrogeology" by A.N. Tokarev, A.V. Shcherbakov, Geological State Publishing House, 1956, 262 pages, price Roubles 13,40 ("Radiogidrogeologiya", Tokarev, A.N., Shcherbakov A.V., Gosgeoltekhizdat, 1956, 262 stranits, tsena 13,40 Rub.)

PERIODICAL: Atomnaya Energiya, 1957, Vol. 3, Nr 10, pp. 376-377 (USSR)

ABSTRACT: This book is the first of its kind to be published in the Soviet Union. It consists of two parts. The first part contains three chapters: The first chapter discusses the causes of radioactive elements contained in water. The second chapter deals with the problem of various types of natural radioactive water. The third chapter is devoted to hydrogeological conditions which lead to the formation of uranium deposits. The second part consists of six chapters dealing with radiohydrogeological methods of investigation. The book contains both theoretical as also a large number of experimental data which were most suitable selected by the authors on the strength of their many years of experience. It is a drawback of this book that the text was not sufficiently well revised and corrected.

AVAILABLE: Library of Congress

Card 1/1



BRODSKIY, A.A. [deceased]; TOKAREV, A.N., red.

[Fundamentals of hydrogeochemical prospecting methods for sulfide deposits.] ~~Osnovy gidrogeokhimicheskogo metoda poiskov sul'fidnykh mestorozhdenii.~~ Moskva, Izd-vo "Nedra," 1964. 257 p. (Moscow. Vsesoiuznyi nauchno-issledovatel'ski institut gidrogeologii i inzhenernoi geologii. Trudy, no.12)

ROGAL'-LEVITSKIY, G.A., inzh.; TOKAREV, A.P., inzh.

Standard designs of boiler systems. Prom. energ. 20 no.2:45-46  
'65. (MIRA 18:4)

VOLKOV, M.I., dots.; KOROLEV, S.A.; LOPATKIN, V.G., dots.; TOKAREV, A.P.;  
KOZLOVA, G.A., prof., red.; KOKOSHKO, A.G., red.; MARTYNOVA,  
M.N., tekhn. red.

[Socialist means of production] Sotsialisticheskii sposob  
proizvodstva. Moskva, Izd-vo "Mysl'." No.3. [Funds of  
socialist enterprises and the formation of net income in a  
socialist enterprise] Fondy sotsialisticheskikh predpriatii  
i obrazovanie chistogo dokhoda v sotsialisticheskom khoziai-  
stve. 1964. 186 p. (MIRA 17:4)

1. Kommunisticheskaya Partiya Sovetskogo Soyuza. Vysshaya  
partiynaya shkola. Kafedra politicheskoy ekonomii.

TOKAREV, Aleksandr Pavlovich

[Ground rent and the distribution of income on collective farms] Zemel'naia renta i raspredelenie dokhodov v kolkho-  
zakh. Moskva, Mysl', 1964. 134 p. (MIRA 18:4)

SPASSKIY, S.S.; MIKHAYLOVA, M.A.; TOKAREV, A.V.; TARASOV, A.I.

Contact oxidation of commercial phenanthrene with oxygen from the  
air. Zhur.prikl.khim. 29 no.3:447-458 Mr '56. (MLRA 9:8)

1. Ural'skiy filial Akademii nauk SSSR.  
(Phenanthrene) (Oxidation)

SPASSKIY, S.S.; TOKAREV, A.V.; MIKHAYLOVA, M.A.; TARASOV, A.I.; MOLCHANOVA, T. V.;  
MAT'KOVA, M. Ye.

Copolymerization of unsaturated polyesters with vinyl monomers. Trudy  
Inst. khim. UFAN SSSR no.3&21-32 '59 (MIRA 14:3)  
(Esters) (Vinyl compounds) (Polymerization)

5.3830

77395  
SOV/79-30-1-56/78

AUTHORS: Spasskiy, S. S., Tokarev, A. V., Mikhaylova, M. A.,  
Molchanova, T. V., Matkova, M. Ye.

TITLE: Copolymerization of Unsaturated Polyesters With Vinyl  
Monomers. III Concerning the Nature of Copolymeriza-  
tion of Unsaturated Polyesters With Vinyl Monomers

PERIODICAL: Zhurnal obshchey khimii, 1960, Vol 30, Nr 1, pp 250-257  
(USSR)

ABSTRACT: Copolymers of poly(1,3-butylene glycol fumarate) with  
vinylcarbazole, acrylonitrile, vinyl acetate, methyl  
methacrylate, and poly(ethylene glycol fumarate) with  
vinyl acetate were prepared in order to study the  
nature of this copolymerization. Literature data  
concerning the copolymerization constants of different  
copolymers are reviewed. Copolymerization of polyesters  
with acrylonitrile, vinyl acetate, and methyl meth-  
acrylate was conducted in sealed glass ampoules in a

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Copolymerization of Unsaturated Polyesters  
With Vinyl Monomers. III.

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nitrogen atmosphere. The ampoules were placed in a thermostat at  $60 \pm 0.1^\circ$ . Benzoyl peroxide was used as an initiator. After completion of the reaction (to the given extent), the ampoules were removed from the thermostat and frozen with liquid nitrogen. The trimeric copolymer was separated from other products of reaction and the initial products by treatment with acetone containing traces of hydroquinone, and washing with acetone. Copolymerization of poly(1,3-butylene glycol fumarate) with vinylcarbazole was conducted in toluene solution (in nitrogen atmosphere) in the presence of benzoyl peroxide (up to 1%). The mixture was heated for 65 hr at  $100^\circ$ , but no copolymers were obtained. From the data obtained, the following conclusions were made: activity of acrylonitrile in the reactions with polyesters is low in comparison with its activity in the reactions with diesters of fumaric acid. Copolymerization of vinylcarbazole with polyesters does not take place at all. Apparently, the bulky substituents cause steric hindrance affecting

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the copolymerization process. The activity of vinyl acetate in the copolymerization remains unchanged. Copolymerization constants of the following copolymers were determined:

	$r_1$	$r_2$
Poly(1,3-butylene glycol fumarate) - acrylonitrile	$1.12 \pm 0.040$	$1.03 \pm 0.2$
Poly(1,3-butylene glycol fumarate) - methyl methacrylate	$0.5 \pm 0.5$	$2.1 \pm 0.30$
Poly(1,3-butylene glycol fumarate) - vinyl acetate	$0.2 \pm 0.2$	$0.15 \pm 0.07$
Poly(ethylene glycol fumarate) - vinyl acetate	$0.2 \pm 0.1$	$0.020 \pm 0.02$

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Copolymerization of Unsaturated Polyesters  
With Vinyl Monomers. III

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SOV/79-30-1-56/78

There are 4 tables; 2 figures; and 16 references, 2 U.S., 5 U.K., 9 Soviet. The 5 most recent U.S. and U.K. references are: B. Hayes, R. Hunter, Chem. and Ind., 1957, 559; V. Wycherly, Chem. and Ind., 1957, 491; W. Robertson, D. Shepherd, Chem. and Ind., 1958, 126; B. Hayes, W. Read, L. Vaygan, Chem. and Ind., 1162 (1957); F. Leavitt, V. Stannett, M. Szwarc, Chem. and Ind., 28, 985 (1957).

ASSOCIATION: Ural Branch of the Institute of Chemistry, Academy of Sciences, USSR (Uralskiy filial AN SSSR, Institut khimii)

SUBMITTED: July 29, 1958

Card 4/4

TOKAREV, A.V.; FINGER, G.G.

Seminar and conference on the chemistry and technology of  
synthetic fibers. Khim. volok. no.1:75-76 '65.

(MIRA 18:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo  
volokna.

83471

S/190/60/002/009/001/019  
B004/B060

15.8000 *class* 2109, 2209

AUTHORS:

Spasskiy, S. S., Matikova, M. Ye., Tokarev, A. V.

TITLE:

Copolymerization of Unsaturated Polyesters With Vinyl Monomers. VI. Thermomechanical Analysis of the Copolymers of Unsaturated Polyesters and Vinyl Monomers

PERIODICAL:

Vysokomolekulyarnyye soyedineniya, 1960, Vol. 2, No. 9, pp. 1297-1300

TEXT: In previous articles (Refs. 1, 2), the authors studied the copolymerization of the polyesters ( $M_1$ ) polydiethylene glycol fumarate and poly-1,3-butylene glycol fumarate with the vinyl monomers ( $M_2$ ) styrene, vinyl acetate, acrylonitrile, and methyl methacrylate, and determined the copolymerization constants given in a table of the present paper. On the basis of these constants, the authors determined the polymer structure by calculating the fraction of  $M_2-M_2$ ,  $M_1-M_2-M_1-M_2$ , or  $M_1-M_1$  bonds. In the present article, the authors describe the thermomechanical

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Copolymerization of Unsaturated Polyesters  
With Vinyl Monomers. VI. Thermomechanical  
Analysis of the Copolymers of Unsaturated  
Polyesters and Vinyl Monomers

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B004/B060

behavior of the copolymers. A method developed by V. A. Kargin et al. (Refs. 3,4) was used for their investigation. Deformation as a function of temperature was measured by means of an apparatus designed by V. L. Taetlin, V. I. Gavrilov, N. A. Velikovskaya, and V. V. Kochkin (Ref. 5). Respective curves are shown in Fig. 1. The curves observed were of two types. In the first type (copolymers of the two polyesters with vinyl acetate and of poly-1,3-butylene glycol fumarate with styrene in an azeotropic ratio), deformation starts only at the decomposition temperature (between 270 and 290°C; at 240 - 245°C, only in the case of acrylonitrile copolymers). In the second type (copolymers with nonazeotropic ratio of components, copolymers with styrene excess, copolymers of methyl methacrylate), deformation already takes place at a lower temperature; but with further rising temperature the curve forms a plateau (deformation remains constant), until a further deformation occurs at the decomposition temperature. The curves of the first type are characteristic of  $M_1-M_1-M_1$  and  $M_1-M_2-M_1-M_2$  bonds, while the curves of the second type are

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Copolymerization of Unsaturated Polyesters  
With Vinyl Monomers. VI. Thermomechanical  
Analysis of the Copolymers of Unsaturated  
Polyesters and Vinyl Monomers

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B004/B060

characteristic of linear structures with  $M_2-M_2-M_2$  bonds. These results confirm the structures calculated from the copolymerization constants. The authors thank G. L. Slonimskiy for his introduction into the method of thermomechanical analysis. There are 1 figure, 1 table, and 6 Soviet references.

ASSOCIATION: Institut khimii Ural'skogo filiala AN SSSR (Institute of Chemistry of the Ural Branch AS USSR)

SUBMITTED: November 25, 1959

X

Card 3/3

5(4)

AUTHORS:

Spasskiy, S. S., Tarasov, A.I, Tokarev, A.V. SOV/76-33-2-2/45

TITLE:

Copolymerization of Unsaturated Polyesters and Vinyl Monomers (Sopolimerizatsiya nenasyshchennykh poliefirov s vinilovymi monomerami). I. Determination of the Number of Double Bonds in Copolymers of Unsaturated Polyesters and Vinyl Monomers (I. Opredeleniye chisla dvoynnykh svyazey v sopolimerakh nenasyshchennykh poliefirov i vinilovykh monomerov)

PERIODICAL:

Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 2, pp 249 - 254 (USSR)

ABSTRACT:

Although these copolymers represent new thermally reactive synthetic materials the principles involved in their copolymerization have not been sufficiently investigated. The possibilities of applying two methods, based on the additivity of the specific volumes and of the specific refractions, were investigated. The following systems were used in checking the methods: polydiethylene glycol fumarate - acrylonitrile; polydiethylene glycol fumarate (I) - styrene; (I)-methyl methacrylate; (I)-vinyl acetate. Laboratory workers M. A. Mikhaylova, T. V. Molchanova, M. K. Mat'kova participated in the experiments. The copolymerization was carried out

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Copolymerization of Unsaturated Polyesters and Vinyl Monomers. I. Determination of the Number of Double Bonds in Copolymers of Unsaturated Polyesters and Vinyl Monomers SOV/76-33-2-2/45

in glass ampuls in the presence of 0.1% by weight benzoyl peroxide in a nitrogen atmosphere and at  $60 \pm 0.5^\circ\text{C}$ . The index of refraction was determined using an Abbe refractometer. The magnitude of the specific shrinking of the polyester chain was determined by proceeding upon the assumption (Ref 7) that the shrinkage of the monomers in the polymerization (contraction) is dependent upon their structures. The styrene-methyl methacrylate system was tested using the rule of the additivity of the specific volumes (Table 2). The contraction was determined from the specific volumes of the diethyl fumarate (II) and polydiethyl fumarate (III) using the equation  $P = M(\delta_P - \delta_{PF})$  ( $P$  = contraction,  $M$  = molecular weight of (II),  $\delta_P$ ,  $\delta_{PF}$  = specific volumes of (II) and (III)); the value found was 16.7. The specific shrinkage for the chain of (I) was found to be 0.08971. The determination of the increments of the monomer double bond was carried out using the specific refraction (Table 4); a value of 0.0144 was found for (I). The results obtained by both

Card 2/3



Copolymerization of Unsaturated Polyesters and Vinyl Monomers. I. Determination of the Number of Double Bonds in Copolymers of Unsaturated Polyesters and Vinyl Monomers SOV/76-33-2-2/45

methods described above (Table 5) are in good agreement, and it may be concluded from these determinations that both methods are equally valid in determining the copolymerization constants of unsaturated polyesters and vinyl derivatives. There are 5 tables and 8 references, 5 of which are Soviet.

ASSOCIATION: Ural'skiy filial Akademii nauk SSSR, Sverdlovsk (Ural Branch of the Academy of Sciences, USSR, Sverdlovsk)

SUBMITTED: March 6, 1957

Card 3/3

68949

SOV/81-59-24-88951

5.3830

Translation from: Referativnyy zhurnal. Khimiya, 1959, Nr 24, p 643 (USSR)

AUTHORS: Tokarev, A.V., Spasskiy, S.S.

TITLE: An Investigation of the Copolymers of Poly-1,3-Butyleneglycolfumarate and Styrene

PERIODICAL: Tr. In-ta metallurgii, Ural'skiy fil. AS USSR, 1958, Nr 4, pp 127 - 132

ABSTRACT: Diagrams plotted of the integral and differential composition of the copolymers show that in the case of the initial ratios of the monomers, which differ from azeotropic ratios, the reaction mixture is enriched in styrene. The dependence between the structure of copolymers and their mechanical properties was studied by means of Kargin's method based on the plotting of thermomechanical curves, on which the polystyrene regions can be detected. The samples for the test were prepared by block polymerization in an N<sub>2</sub> atmosphere in the presence of benzoyl peroxide at 70°C and various initial ratios of the components. Together with the trimer also linear polystyrene chains are contained in the copolymer; at the same time also copolymers are formed which are relatively homogeneous in their composition.

Card 1/2

68949

SOV/81-59-24-88951

An Investigation of the Copolymers of Poly-1,3-Butyleneglycolfumarate and Styrene

With an increase in the styrene content in the initial mixture the mechanical resistance of the copolymer (impact and bending resistance) deteriorates. The copolymers are solid, transparent, almost colorless, substances which are insoluble in any of the usual solvents. The study of the physical-mechanical and electrical properties showed that the new substance can be used as electric insulation material.<sup>15</sup>

N. Motovilova

4

Card 2/2

SPASSKIY, S.S.; MAT'KOVA, M.Ye.; TOKAREV, A.V.

Copolymerization of unsaturated polyesters with vinyl monomers.  
Part 6. Vysokom. soed. 2 no.9:1297-1300 S '60. (MIRA 13:9)

1. Institut khimii Ural'skogo filiala AN SSSR.  
(Esters) (Vinyl compounds)  
(Polymers--Thermal properties)

FOR AKEY A.V  
P3 1

PHASE I BOOK EXPLOITATION

SOV/3938

Akademiya nauk SSSR. Ural'skiy filial. Institut khimii.

Sbornik rabot laboratorii vysokomolekulyarnykh soyedineniy, No. 2 (Collected Papers of the Laboratory of High-Molecular Compounds, No. 2) Sverdlovsk, 1959. 53 p. (Series: Its: Trudy, vyp. 3) Errata slip inserted. 1,000 copies printed.

Eds.: V.G. Plyusnin, Doctor of Chemistry, and V.N. Kozlov, Doctor of Technical Sciences; Tech. Ed.: N.F. Seredkina.

**PURPOSE:** This collection of three articles is intended for chemists and technicians interested in the chemistry of high-molecular compounds and polymers.

**COVERAGE:** The first article of this collection discusses the expression of the activity factor in the Alfrey and Price equation by a constant which could be determined independently of equations

Card 1/3

Collected Papers of the Laboratory (Cont.)

SOV/3938

$$r_1 = \frac{Q_1}{Q_2} e^{-e_1(e_1 - e_2)}, \quad r_2 = \frac{Q_2}{Q_1} e^{-e_2(e_2 - e_1)}, \quad \text{where } r_1 \text{ and}$$

$r_2$  are the copolymerization constants,  $Q_1$  and  $Q_2$  are the activity factors of the monomers,  $e_1$  and  $e_2$  are the polar factors of the monomers, and  $e$  is the base of the natural logarithms. The article explores the possibility of using for this end a value characterizing the dimensions [size] of the electron cloud formed by  $\pi$ -electrons of the reacting double and short bonds conjugated with it. The second article reports on a study made of the copolymerization of polydiethylene glycol fumarate and of poly-1, 3-butylene glycol fumarate with styrol, methylmethacrylate, acrylonitrile and vinyl acetate to explain the peculiarities of the copolymerization reaction of unsaturated polyesters with vinyl monomers. The third article reports on a study of the behavior of nitrile rubbers and polyesters of various structure used as plasticizers. L.M. Gindin, A.D. Abkin, and S.S. Medvedev are mentioned. References accompany each article.

Card 2/3

Collected Papers of the Laboratory (Cont.)

SOV/3938

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AVAILABLE: Library of Congress

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TM/rem/lsh  
8-16-60

TOKAREV, A., inzh.

Vibration drilling of soil in winter. Avt. dor. 26 no.1:21-22  
Ja '63. (MIRA 16:6)

(Boring)



TOKAREV, A., inzh.

Operating requirements of a large-capacity city bus. Avt.transp.  
38 no.6:41-43 Je '60. (MIRA 14:4)

(Mctorbuses)

KONTOBAYEV, M.I.; TATAUCHENKOV, P.S.; YEREMEV, A.I.

Automatic proportioning device for mineralizing additions.  
Ogneupory 29 no.10:440-442 1961. (MIRA 18:7)

1. Pervouralskiy dirasovyy zavod.

AL'TOVSKIY, M. Ye.; GOLEVA, G.A.; KRAYNOV, S.R.; SLAVYANOVA, L.V.;  
TOKAREV, A.N.; FROLOV, N.M.; SHVETS, V.M.

Development of V.I.Vernadskii's concept in present-day hydrogeology.  
Trudy VSEGINGEO no.9:5-20 '64. (MIRA 17:10)

TOKAREV, A. V., Cand of Chem Sci -- (diss) "Polymerization of the Pole-1.3 Butylenglicol-phumarate With a Sterol," Sverdlovsk, 1959, 10 pp (Institute of Chemistry, Ural Affiliate of the Academy of Sciences USSR) (KL, 4-60, 115)

ТОКАРЕВ, А.У.

Аннотация кат. СССР. Урал'ский филиал. Институт металлургии  
 Study, Vyp. 4 (Transactions of the Institute of Metallurgy, Ural Branch,  
 Academy of Sciences, USSR; No. 4) Sverdlovsk, 1959. 157 p. Errors  
 only corrected. 1,000 copies printed.

Митчелл Бранд: М.А. Веттис (Resp. Ed.), Candidates of Technical Sciences;  
 А.С. Милославский, Инженер, Доктор; В.И. Миллер, Профессор; П.А. Пашков,  
 Доктор; С.И. Липов, Доктор; and С.И. Липов, Candidate of Technical  
 Sciences; М.А. М.С. Барановский.

FOREWORD: This book is intended for ferrous and nonferrous metallurgists.  
 CONTENTS: The book presents results of investigations of theoretical pro-  
 cesses in metallurgy and chemistry and gives information on the efficient  
 use of raw materials in ferrous and nonferrous metallurgy and on the de-  
 velopment of new production processes in the metallurgical and chemical  
 industries. The articles are written by junior members and experienced  
 specialists of the scientific staff of the Institutes of Metallurgy,  
 Chemistry, and Electrochemistry, Ural Branch, Academy of Sciences, USSR.  
 Бранд, М.А., И.В. Сегородилов and П.А. Пашков. Electrical Resistance  
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TOKAREV, A.V.; SPASSKIY, S.S.

~~Investigating the copolymers poly-1,3-butanediol fumarate and~~  
styrene. Trudy Inst. met. UPAN SSSR no.4:127-133 '58.  
(MIRA 12:10)

(Polymers)

... of 10/1000 is given. The best catalyst was  
... (methyl val). The best yields of total hydro products  
... (phthalic anhydride, maleic anhydride, and succinic anhydride)  
... were followed. ... of phthalic anhydride was ...

*TOKA REV, A.V.*



SPASSKIY, S.S.; TARASOV, A.I.; TOKAREV, A.V.

Copolymerization of unsaturated polyesters and vinyl monomers.  
Part 1: Determination of the number of double bonds in copoly-  
mers of unsaturated polyesters and vinyl monomers [with summary  
in English]. Zhur.fiz.khim. 33 no.2:249-254 F '59.

(MIRA 12:4)

1. Ural'skiy filial AN SSSR, Sverdlovsk.  
(Polymers) (Chemical bonds)

USSR / Cultivated Plants. Plants for Technical Use. M  
Oil Plants. Sugar Plants.

Abs Jour : Ref Zhur - Biologiya, No 6, 1959, No. 24953

Author : Tokarev, B.

Inst : Not given

Title : Productivity of Cotton Crop Rotations on  
the "Hunger Steppe" with Two or Three Fields  
of Grasses

Orig Pub : Khlopkovodstvo, 1958, No 3, 38-40

Abstract : Experiments on the productivity study of  
cotton-alfalfa crop rotations under the  
conditions of the "Hunger Steppe", conducted  
by the Pakhta-Aral' Experimental Station of  
the Kazakh Institute of Agriculture, indicated  
that the greatest retardation in the growth  
and development of cotton is observed in crop

Card 1/2

TEKAREV B.

USSR/Cultivated Plants - Technical, Oleaginous, Sacchariferous.

1-7

Abs Jour : Tr. Akad. - Biol., No 9, 1956, 39393

Author : Tekarev, B.

Inst : -

Title : The System of Pre-Sowing, Soil Cultivation by Washing,  
Irrigation.

Orig Pub : Kolokovodstvo, 1957, No 3, 39-41

Abstract : The experiment took place in the Paldita-Aral'sk experi-  
mental station with following versions: pre-sowing harrow-  
ing in two tracks, chiseling to a depth of 10-12 cm with  
subsequent harrowing, re-plowing of the fall plowing with  
subsequent harrowing. The greatest yield of cotton wool  
was obtained by chiseling. In the Kolkhoz im. Arangel'dy  
a fall-winter washing on 450 ha and pre-soil cultivation  
by shallow LD-10 disk plows to a depth of 8-10 cm with si-  
multaneous harrowing in two tracks were applied for the  
1956 harvest. The yield of cotton wool was 38 crt/ha.

Card 1/2

- 103 -

USSR/Cultivated Plants - Technical, Olaginous, Sacheriferous.

H-7

Abs Jour : Ref Tur - Biol., No 9, 1958, 39393

The best methods of pre-sowing fall-plowing cultivation with light gray desert soils on salted soils of the Golodnaya steppe after washing are chiseling to a depth of 10-12 cm or disking by shallow plows to a depth of 8-10 cm with simultaneous harrowing in two tracks in one aggregate. The sowing of cotton plant takes place immediately after pre-sowing cultivation. -- P.N. Kizina

Card 2/2

TOKAREVA, B.A., kandidat meditsinskikh nauk

Gadfly larva in the anterior chamber of the eye. Vest. oft.  
34 no.5:40-41 S-O '55. (MLRA 8:11)

1. Iz glaznogo otdeleniya I. Moskovskoy detskoy klinicheskoy  
bol'nitsy.

(MYIASIS,  
ocular, gadfly larva)  
(EYE, diseases,  
myiasis, gadfly larva)

~~B.F. Tokarev, B.F.~~

Subject : USSR/Electricity AID P - 4096  
Card 1/2 Pub. 27 - 7/24  
Authors : Goryainov, F. A., Kand. Tech. Sci., Dotsent, and B. F. Tokarev, Kand. Tech. Sci., Moscow  
Title : Influence of magnetic asymmetry upon the performance of a three-step rotating regulator.  
Periodical : Elektrichestvo, 11, 43-46, N 1955  
Abstract : The authors investigate the influence of magnetic asymmetry on the basis of a magnetic equivalent circuit of the rotating regulator. They analyze two cases of asymmetry: the one occurring when under the like poles of the first and third steps and also of the second and third steps a larger air gap is placed than under the poles of opposite polarity; the second, when under the like poles of the first and third and also second and third steps a smaller air gap is placed than under the poles of opposite polarity. The authors conclude that

Elektrichestvo, 11, 43-46, N 1955

AID P - 4096

Card 2/2 Pub. 27 - 7/24

in the first case the magnetic asymmetry causes a sharp decline of the coefficient of amplification, and in the second is the cause of self-excitation of the rotating regulator. Five drawings and diagrams.

Institution : Moscow Power Engineering Institute im. Molotov

Submitted : Fe 21, 1955

TOKAREV, B.F.

112-3-5813

Translation from: Referativnyy Zhurnal, Elektrotehnika, 1957,  
Nr 3, pp. 108-109 (USSR)

AUTHOR: Goryainov, F.A., and Tokarev, B.F.

TITLE: Transients in a Three-Stage Longitudinal-Field Dyna-  
motor (Perekhodnyye protsessy v trekhstupenchatom EMU  
prodol'nogo polya)

PERIODICAL: Tr. Mosk. energ. in-ta, 1956, Nr 16, pp. 134-144

ABSTRACT: A three-stage longitudinal-field self-excited dynamo-  
electric amplifier is discussed; it possesses high power  
gain and rapid response. [Included in the abstract is  
a schematic diagram of the dynamo-electric amplifier,  
showing the first stage control winding (located on two  
opposite poles); the third stage control winding (located  
on all main poles); the self-excitation winding (located  
on all main poles; compensating winding (located on the  
same poles as the first stage control winding); and a  
winding for auxiliary commutating poles]. The dyna-  
motor has three stages of amplification and excitation.

Card 1/4



112-3-5813

Transients in a Three-Stage Longitudinal-Field Dynamotor

If the magnetic circuit is not saturated, and if the armature reaction due to current  $I_{24}$  is fully compensated, the following system of linear differential equations may be written: First stage:  $m_y U_y = (1 + pT_y)E_{13}$

Second stage:  $m_2 E_{13} = (1 + pT_2)E_{24}$  Third stage:  $m_3 E_{24} =$

$(1 + pTe_1) (1 + pTe_2) E_{3T}$ , where  $m_y = \frac{E_{13}}{U_y}$ ,

$m_2 = \frac{E_{24}}{E_{13}}$ ,  $m_3 = \frac{E_{3T}}{E_{24}}$  -- voltage

gain of the corresponding stage;  $T_y$ ,  $T_2$ , etc., are time constants computed by means of formulae provided in the text. A relationship between  $U_y$  (the input voltage) and  $E_{3T}$  (the output voltage) is obtained from the above system of equations:

$$mU_y = (1 + pT_y)(1 + pT_2)(1 + pTe_1)(1 + pTe_2) E_{3T}$$

Card 2/4

112-3-5813

## Transients in a Three-Stage Longitudinal-Field Dynamotor

where  $m = m_1 m_2 m_3$  is the overall voltage gain. In the event there are no auxiliary commutating poles in the dynamotor, the relationship between  $U_y$  and  $E_{3T}$  assumes the following form:

$$m U_y = (1 + pT_y)(1 + pT_2)(1 + pT_e) E_{3T} ,$$

where  $T_e = \frac{R_{sh}}{R_{sh} - R_c} (T_{sh} + T_3)$  ;  $R_{sh}$  - resistance of the self-exciting circuit;  $R_c$  - critical resistance. The formulae obtained were checked by comparison of design and experimental data for 400-watt dynamotors. The following conclusions may be made on the basis of the comparison: 1. The duration of a transient is determined mainly by the maximum equivalent time constant of the third (last) stage ( $T_{e2}$  or  $T_e$ ). The value of this time constant depends upon the ratio of  $R_{sh}$  to  $R_c$ . The larger the resistance  $R_{sh}$  in comparison with  $R_c$ , the more rapid the transient, but

Card 3/4

112-3-5813

Transients in a Three-Stage Longitudinal-Field Dynamotor

the smaller the power gain. The equivalent time constant can be decreased by decreasing the time constant of the circuit of brushes 2 and 4 and of the self-excitation winding. The time constant of the circuit of brushes 2 and 4 can be decreased by reducing the number of turns of the third stage control winding. 2. Insufficient compensation of the armature reaction to current  $I_{24}$  accelerates the transient to some extent, and overcompensation retards the transient. 3. The coincidence of the design and experimental curves is sufficiently close for application of the equations to the computation of transients in the three-stage dynamo-electric amplifier.

O.I.Z.

ASSOCIATION: Moscow Institute of Power Engineering (Mosk. energ. in-t)

Card 4/4

TOKAREV, B. F.  
and  
GORYAINOV, F. A.

"Transient Processes in a Three-Stage Amplidyne with Longitudinal Field, " pp 134-144, ill

Abst: Differential equations are presented which describe the transient process in an amplidyne with three-stage excitation.

SOURCE: Trudy Moskovskogo Energeticheskogo In-ta im. V. M. Molotova (Works of the Moscow Energetics Institute imeni V. M. Molotov), No 16, Electromechanics, Moscow-Leningrad, Gosenergoizdat, 1956.

112-1-722

Translation from: Referativnyy Zhurnal, Elektrotehnika, 1957, Nr 1, p. 120 (USSR)

AUTHORS: Goryainov, F. A., Tokarev, B. F.

TITLE: Design of a Three-Stage Dynamoelectric Amplifier of the Longitudinal Field (K raschetu trekhstupenchatogo elektromashinnogo usilitelya prodol'nogo polya)

PERIODICAL: Tr. Mosk. energ. in-ta, 1956, Nr 16, pp. 145-148

ABSTRACT: Recommendations are given concerning the design of a 4-pole 3-stage amplidyne (EMU) of the longitudinal field, with self-excitation winding in the last stage. The calculation is done separately for every stage starting from the terminal (third), because of the unsaturated magnetic system. The selection of the main dimensions is made according to the formula of the machine constant. The values of  $B_p$  are taken as 1.5 to 3 times, and those of AS as 1.1 to 1.2 times smaller than in normal machines. A percentage value of the relationship between the magnetizing force of the self-excitation winding and of the control winding of the third stage is given, and also between the output currents of the third, second and first stages. The magnetizing forces of the control windings of the second and first stages are determined from the conditions

Card 1/2

112-1-722

Design of a Three- Stage Dynamoelectric Amplifier of the Longitudinal Field (Cont.)

of generating the electromotive force which provides the required current in the controlling winding of the subsequent stage. In order to secure a normal commutation of all three armature currents, the auxiliary poles of the EMU are provided with four coils each. A connection diagram for these coils is provided and formulas for the selection of the number of their turns are given. The compensating winding for compensating the armature reaction of the third stage control current is placed on the same poles as the control winding of the first stage. The compensating winding has a number of turns per pole equal to  $N/16$ , where  $N$  is the number of active armature conductors. V. S.M.

Card 2/2

8(3)

AUTHOR:

Tokarev, Boris Fedorovich, Candidate  
of Technical Sciences, Docent at the Chair for Electrical  
Machines of the Moscow Power Engineering Institute

SOV/161-58-2-17/30

TITLE:

Static Characteristics of a Three-Stage Electrodynamic  
Longitudinal Field Amplifier (Sticheskiye kharakteristiki  
trekhstupenchatogo elektromashinnogo usilitelya prodol'nogo  
polya)

PERIODICAL:

Nauchnyye doklady vysshey shkoly. Elektromekhanika i avtomatika,  
1958, Nr 2, pp 139 - 145 (USSR)

ABSTRACT:

The three-stage electrodynamic longitudinal field amplifier  
is carried out in such a way as not to be totally exploited  
with regard to its magnetic properties as is the case with  
all electrodynamic amplifiers. Therefore, the analysis of  
its characteristics can be made without considering the  
saturation of the magnetic system. The three stages are ana-  
lyzed. Unlike the first two stages the third one is a  
quadripole system. The amplification factor K is then in-  
vestigated and the formula for its determination is derived.  
This formula demonstrates the influence of all construction

Card 1/2

Static Characteristics of a Three-Stage Electrodynamic Longitudinal Field Amplifier SOV/161-58-2-17/30

and electromagnetic principal parameters on the amplification factor. At a given output the factor K of the three-stage electrodynamic longitudinal field amplifier increases with decreasing induction within the air gap, with reduction of the air gap and of the current density in the windings. For this reason, in order to attain an increase in the amplification factor a machine has to be used the magnetic and electric properties of which are not completely exploited. From the same formula it can be seen that with an increase in the rotational speed and with an increase of the number of active conductors of the armature winding the amplification factor rises, all other conditions remaining unchanged. An increase in the number of turns of the control winding of the third stage also leads to an increase in the amplification factor. There is 1 figure.

ASSOCIATION: Kafedra elektricheskikh mashin Moskovskogo energeticheskogo instituta (Chair for Electrical Machines of the Moscow Power Engineering Institute)

SUBMITTED: January 2, 1958  
Card 2/2



8(3)

AUTHOR:

Tokarev, B. F., Candidate of Technical  
Sciences, Docent

SOV/105-59-7-3/30

TITLE:

Commutation in Multi-stage Electromotor Amplifiers of the  
Longitudinal Field (Kommutatsiya v mnogostupenchatyykh EMU  
prodol'nogo polya)

PERIODICAL:

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ABSTRACT:

Additional poles of multi-stage electromotor amplifiers of the longitudinal field generate a commutating field for the currents of various intensities flowing in the armature coil. This is attained by connecting the windings of the additional poles according to the special circuit described in reference 1. It is shown here that this circuit is not able to warrant satisfactory commutation of the currents of the various stages, because the unequal conditions in their commutation are not taken into account. A method of calculating the commutation and the additional poles in multi-stage electromotor amplifiers of the longitudinal field is precisely described. The commutation of a three-stage amplifier is investigated. However, the results obtained apply also to a two-stage one. As regards construction, the three-stage electric machine amplifier is a direct current motor with 4 poles. The

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armature coil is a lap winding without equipotential connections. The winding pitch is nearly equal or equal to the pole pitch. On two opposed poles (e.g. 1 and 3) the control winding is fitted. In the armature coil of a three-stage amplifier three currents, viz.  $I_{13}$ ,  $I_{24}$  and the load current  $I_3$  flow.  $I_{13}$  and  $I_{24}$  are generated by the double-pole-, and  $I_3$  by a four-pole excitation system. In each of the commutating sections two currents are commutated ( $I_3$  and  $I_{13}$  or  $I_3$  and  $I_{24}$ ). The reactive e.m.f. for each of these currents is determined. It is shown that the currents  $I_{13}$  and  $I_{24}$  exercise no reciprocal influence upon the generation of the reactive e.m.f. in the commutation sections during commutation. It is further shown that the resulting inductivity of all sections of an air gap during commutation of the current  $I_3$  will be greater than the resulting inductivity of the same section in the commutation of  $I_{13}$  and  $I_{24}$ . When calculating the additional poles and the reactive e.m.f. of the commutation sections in a three-stage electromotor amplifier

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must be taken into account. In each of the 4 commutation zones of the three-stage amplifier all three currents are commutated. Therefore, the additional poles must compensate the armature coil in each of the zones and must generate the commutation field for all currents. For the purpose of determining the number of windings of additional poles of the first and second stage, formula (16), and for determining that of the third stage formula (17) is written down. Figure 5 shows that the polarity of the additional poles does not agree for the various stages. In order to warrant satisfactory commutation in all stages the winding of the additional poles must be connected according to the wiring diagram shown by figure 6. There are 8 figures and 3 references, 2 of which are Soviet.

ASSOCIATION: Moskovskiy energeticheskiy institut (Moscow Institute of Power Engineering)

SUBMITTED: October 28, 1958

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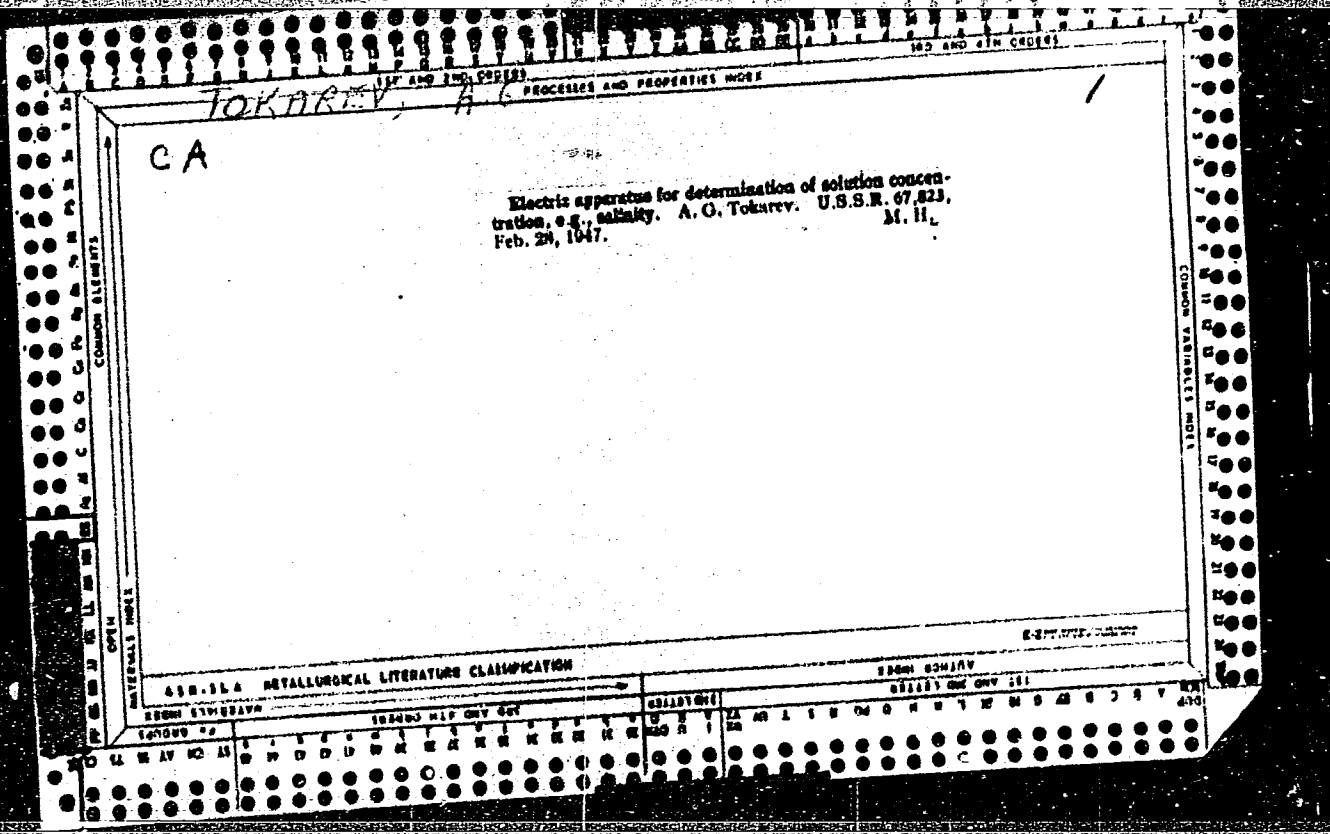
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