CHUVAYEV, V.P.; IVANOVA, L.V.; ZUBOV, P.I.

Nuclear magnetic resonance study of the process of hardening of an unsaturated polyester resin. Vysokom.soed. 6 no.8:1501-1504 Ag '64. (MIRA 17:10)

1. Institut fizicheskoy khimii AN SSSR.

L 1/172-66 EWT(m)/EWP(j) WW/RM

ACC NR: AP6003935 SOURCE CODE: UR/0374/65/000/005/0003/0012

AUTHOR: Sukhareva, L. A. (Moscow); Voronkov, V. A. (Moscow); Kalinina, L. Ye. (Moscow); Kharlamova, A. M. (Moscow); Zubov, P. I. (Moscow); Vorontsova, O. I. (Moscow)

ORG: none

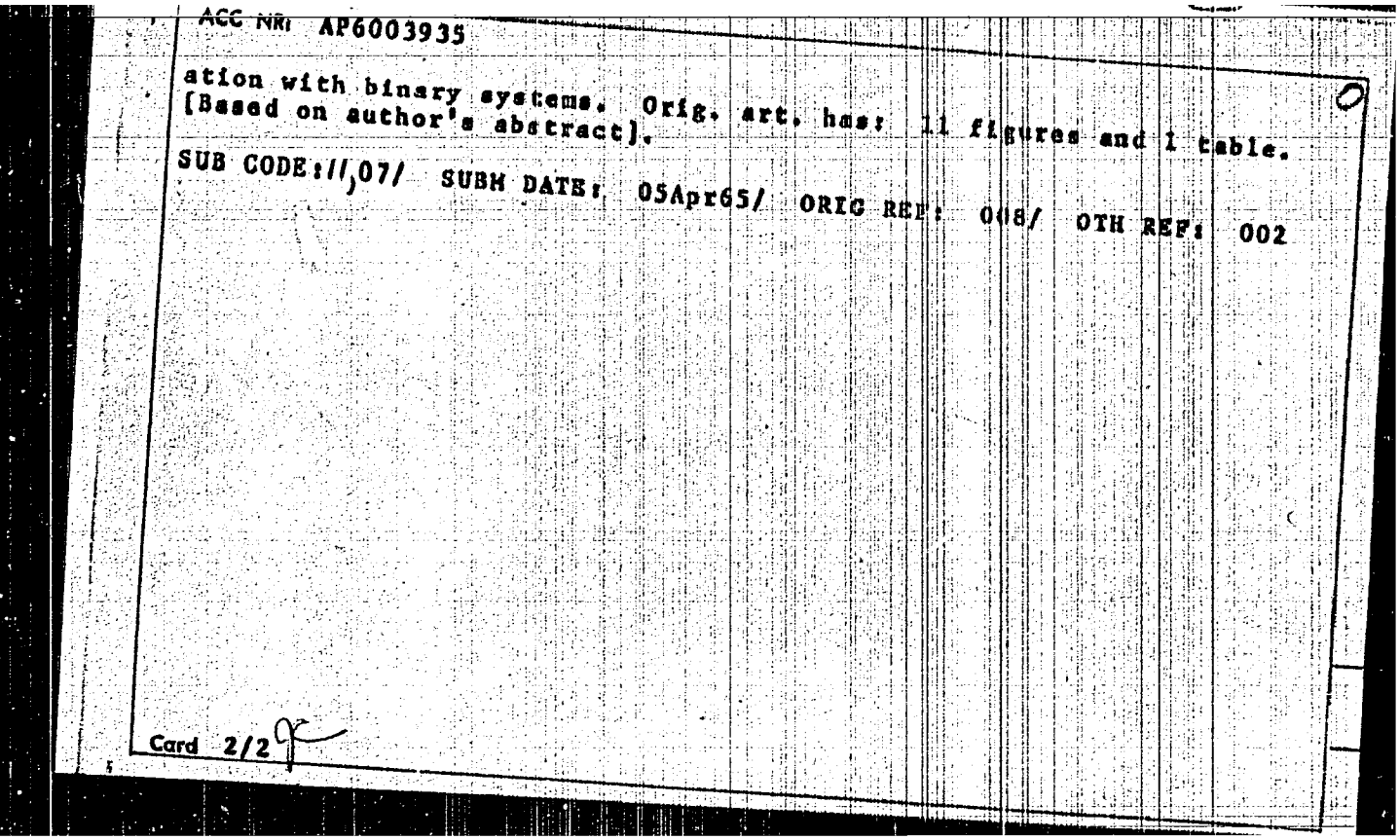
TITLE: Investigation of elastomers on the basis of binary and ternary systems

SOURCE: Mekhanika polimerov, no. 5, 1965, 3-12

TOPIC TAGS: elastomer, synthetic rubber, polyamide, polyvinyl chloride, ~~physical property~~ solid mechanical property, thermomechanical property

ABSTRACT: Physicomechanical and thermophysical properties of elastomers on the basis of binary and ternary systems with different ratios of polyamide, polyvinyl chloride (PVC), and rubber have been investigated. The binary and ternary systems with optimal physicomechanical properties were chosen on the basis of composition property diagrams. A nonmonotonous change of physicomechanical properties of films with a certain ratio of the PVC and nitrile-acrylic acid was observed and is ascribed to chemical interaction. It was shown that stabilization of mechanical properties of polyamide in thermal aging can be accomplished by combin-

Card 1/2 UDC: 678:01.539.37



ACC NR: AP6003935

ation with binary systems. Orig. art. has: 11 figures and 1 table. [Based on author's abstract].

SUB CODE: 11,07/ SUBM DATE: 05Apr65/ ORIG REF: 008/ OTH REF: 002

Card 2/2

L 20146-66 EWT(m)/EWP(v)/EWP(j)/T IJP(c) AT/AM/

ACC NR: AP6013477 SOURCE CODE: UR/0370/66/000/002/0292/0295

AUTHOR: Zubov, P. I.; Sukhareva, L. A.; Grozinskaya, Z. P.; Krylova, L. M.; Kochkin, D. A.; Rzayev, Z. M.

ORG: Institute of Physical Chemistry, Academy of Sciences SSSR (Institut fizicheskoy khimii Akademii nauk SSSR)

TITLE: Study of the physicomechanical properties of styrene-base coatings

SOURCE: Mekhanika polimerov, no. 2, 1966, 292-295

TOPIC TAGS: polymer structure, protective coating, solid physical property, solid mechanical property, adhesion

ABSTRACT: A two-component system obtained by copolymerizing styrene with maleic anhydride in the proportion of 1:1 at 60°C without catalyst or solvent was studied. The mechanism of forming was investigated by studying the internal stresses, the structure of the coatings, and the strength and adhesion characteristics. Kinetic data on internal stresses showed that the forming process is practically complete after one hour of curing and that the limiting value of those stresses is independent of the conditions under which the coatings were formed. The effect of forming temperature on the structure was studied by IR spectroscopy. Coatings formed from acetone solutions were

UDC: 678:539.4019

Card 1/2

ACC NR: AP6013417

found to have a weak adhesion to glass (6-7 kg/cm^2), but those formed from solutions of styromal in dimethylformamide had a higher adhesion (25 kg/cm^2). The elasticity of the coatings increased upon addition of triethylene glycol diester of methacrylic acid (TGM). An increase in the latter gradually lowered the physicomechanical characteristics of the coatings. Coatings most stable to the action of high temperatures were those obtained from solutions in dimethylformamide containing up to 20% TGM. Orig. art. has: 6 figures, 1 table.

SUB CODE: 07,11/ SUBM DATE: 21Jun65/ ORIG REF: 005/ OTH REF: 000

Card 2/2

L 40992-66 EWP(j)/EWT(m)/T/EWP(v) IJP(c) RM/WW

ACC NR: AP6022869 (N) SOURCE CODE: UR/0303/66/000/002/0030/0034

AUTHOR: Naumova, S. F.; Mikhaylovskiy, Yu. N.; Zubov, P. I. 42 B

ORG: none

TITLE: Effect of the vapor and gas permeability of polymer films on their properties

SOURCE: Lakokrasochnyye materialy i ikh primeneniye, no. 2, 1966, 30-34

TOPIC TAGS: protective coating, polymer film, hydrogen chloride, metal oxidation, polyethylene, teflon, polyvinyl chloride, magnesium, ADHESIVE BONDING

ABSTRACT: The effect of the permeability of loose polymer film coatings on the oxidation rate of a metal in a moist atmosphere in the absence of an adhesive bond between the film and the metal was studied. The polymer films were PE-500 high-pressure polyethylene (70 μ thick), polytetrafluoroethylene (teflon) (55 μ), and V-118 polyvinyl chloride (180 μ). A new method of measuring slow oxidation rates of metals was used which involved the recording of changes in the electronic conductivity during oxidation of a thin metal film (~10^{-5} cm) under the polymer film. In order to increase the sensitivity of the method, the metal employed was magnesium, because of its high reactivity. It is shown that in a pure moist atmosphere the oxidation rate of the metal is practically independent of the nature of the polymer film (in the case of a nonadhering film). This is because the rate-determining step in the oxidation is the inhibition of the anodic process of metal ionization (hydration), not the diffusion of moisture

Card 1/2 UDC: 667.613.4

ACC NR: AP6022869

through the coating. In a moist atmosphere containing HCl vapor, which easily penetrates through the film and activates the anodic process, the protective properties of polymer films are completely determined by their moisture permeability. In this case, the chemical nature of the polymer material and its structure are the basic factors determining the protective properties of the films. A quantitative description of the protective effect of polymer films is given. Depending upon the nature of the film, moisture content of the atmosphere, and content of HCl, the protective effect changes by 2 to 3 orders of magnitude. Orig. art. has: 6 figures and 3 formulas.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 014/ OTH REF: 003

Card 2/2

L 45179-66 EWT(m)/EWP(j)/T IJP(c) DJ/RM

ACC NR: AP6017859 (A) SOURCE CODE: UR/0069/66/028/003/0399/0403

AUTHOR: Zubov, P. I.; Kadyrov, M. Sh.; Plavnik, G. M.; Grozinskaya, Z. P.

ORG: Institute of Physical Chemistry, AN SSSR, Moscow (Institut fizicheskoy khimii AN SSSR)

TITLE: Investigation of the wear resistance of epoxy coatings

SOURCE: Kolloidnyy zhurnal, v. 28, no. 3, 1966, 399-403

TOPIC TAGS: wear resistance, friction, resin, titanium dioxide, chromium oxide, epoxy coating, PLASTIC COATING

ABSTRACT: The wear resistance of epoxy coatings has been investigated. The wear value of ED-5 resin coatings with sliding friction is lower when wear products are removed because the protective lubricating layer formed is removed. The addition of talc and cement reduces the coating wear while the addition of titanium dioxide and chromium oxide increases it. The intensive wear of a counterbody was

Card 1/2 UDC: 541.183

L 43779-66
ACC NR: AP6017859

observed in the wearing of coatings filled with cement and chromium oxide. Orig. art. has: 6 figures and 4 formulas. [Based on authors' abstract] [NT]

SUB CODE: 11/ SUBM DATE: 29Jul65/ ORIG REF: 006/ [illegible]

LS
Card 2/2

L 44585-66 EWT(m)/EWP(j)/T IJP(c) WW/RM

ACC NR: AP6015668 (A) SOURCE CODE: UR/0413/66/000/009/0075/0075

INVENTOR: Zubov, P. I.; Kochkin, D. A.; Rzayev, Z. M.; Sukhareva, L. A.

ORG: none

TITLE: Method of obtaining copolymers. Class 39, No. 181289

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 9, 1966, 75

TOPIC TAGS: copolymer, styrene, ether, maleic anhydride, copolymerization, esterification, dehydration

ABSTRACT: An Author Certificate has been issued for a method of obtaining copolymers by esterification of styromal or maleic anhydride, with subsequent copolymerization of the ether obtained with styrene and esterification reagents. To obtain copolymers possessing bactericidal activity, tin or organolead hydroxyl-containing compounds or byproducts of their dehydration are used as esterifying reagents. [Translation] [NT]

SUB CODE: 11/ SUBM DATE: 15May64/

UDC: 678.746.22-134.434.2:667.613:620.193.81

Card 1/1

L 01803-67 EWT(m)/EWP(j)/T IJP(c) WW/RM

ACC NR: AP6030605 (AN) SOURCE CODE: UR/0413/66/000/016/0093/0093

40
B

INVENTOR: Yeliseyeva, V. I.; Avetisyan, I. S.; Drezel'e, S. S.; Zubov, P. I.; Popov, V. A.; Makarov, Yu. A.; Izmaylova, I. S.; Orlova, K. G.; Gerasimova, A. S.; Gordonov, M. D.; Il'chenko, G. I.; Shreyner, S. A.

ORG: none

TITLE: Method of obtaining alkyl acrylate copolymers. Class 39, No. 185057

15

SOURCE: Izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, no. 16, 1966, 93

TOPIC TAGS: copolymer, copolymerization, monomer, alkyl acrylate

ABSTRACT: An Author Certificate has been issued for a method of obtaining alkyl acrylate copolymers with a vinyl acetate by emulsion copolymerization of the proper monomers in the water phase in the presence of an anion emulsifier. To obtain stable dispersions, 1—5 mol % unsaturated carboxylic acid, such as methacrylic acid, is introduced into the initial monomer mixture. [Translation] [NT]

SUB CODE: 07/ SUBM DATE: 16Jan65/

Card 1/1

UDC: 678.744.32-139

L 04964-67 EWT(m)/EWP(j)/EWP(t)/ETI LJP(c) JD/WB/RM

ACC NR: AP6006723 SOURCE CODE: UR/0303/66/000/001/0053/0055

AUTHOR: Sokolova, Ye. M.; Naumova, S. F.; Mikhaylovskiy, Yu. N.; Zubov, P. I.

ORG: none

TITLE: New rapid method of evaluating the protective properties of polymer coatings on metals in corrosive media

SOURCE: Lakokrasochnyye materialy i ikh primeneniye, no. 1, 1966, 53-55

TOPIC TAGS: protective coating, corrosion

ABSTRACT: A rapid method is proposed for evaluating the protective properties of coatings on metals in any corrosive media (i. e., liquid electrolytes, nonelectrolytes or gaseous media). It involves the recording of the change in the resistance of the metal base during the testing. PE-500 polyethylene, PVKh-990 polyvinyl chloride and Teflon were thus tested (in the form of films 90, 190 and 60 μ thick respectively) in HCl and HNO_3 vapors. The polymer films were bonded with polyisobutylene adhesive to magnesium films evaporated onto glass (magnesium was chosen as the metal base because of its high corrosion activity). In the HCl atmosphere, magnesium begins to dissolve immediately after the sample comes in contact with the HCl vapor. The protective properties of the polymer films studied increase in the series polyvinyl chloride - Teflon - polyethylene for both HCl and HNO_3. The results lead the authors to recommend this method as a means of evaluating the protective properties of paint and

Card 1/2 UDC: 667.61

L 04964-67

ACC NR: AP6006723

varnish and insulation coatings on metals. Orig. art. has: 4 figures and 1 formula.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 008/ OTH REF: 004

Card 2/2

ACC NR: AP6031651 SOURCE CODE: UR/0020/66/170/001/0139/0142

AUTHOR: Zubov, P. I.; Kiselev, A. V. ; Krylova, L. M.; Sukhareva, L. A.; Lygin, V. I.

ORG: Institute of Physical Chemistry, Academy of Sciences, SSSR (Institut fizicheskoy khimii Akademii nauk SSSR); Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: Effect of molecular interaction between polymers and solids in the mechanical properties of polymer coatings

SOURCE: AN SSSR. Doklady, v. 170, no. 1, 1966, 139-142

TOPIC TAGS: polymer coating, molecular interaction, ~~polymer~~ solid, internal stress, ~~coating~~ strength, ~~coating~~ adhesion, plastic coating, polyester resin, alkyl resin, plastic filler, mechanical property

ABSTRACT: A study has been made of the interaction of polymer functional groups with filler surfaces, and of the effect of this interaction on the internal stresses, strength, and adhesion of polymer coatings. The experiments were conducted with PN-1 polyester resin or FL-50 akyd resin, and aerosil filler, both nonmodified or modified with actadecylamine. The interaction was studied by IR spectroscopy. The results of the experiments given in graphic form indicated that the mechanical properties of polymer coatings are highly dependent on the nature of the molecular interaction between polymers and solids. Orig. art. has: 4 figures.

SUB CODE: 11, 20/ SUBM DATE: 07Dec65/ ORIG REF: 008/ OTH REF: 001

Card 1/1 UDC: 541.68

ACC NR: AT7002112 (A) SOURCE CODE: UR/0000/66/000/000/0269/0273

AUTHOR: Zubov, P. I.; Sukhareva, L. A.

ORG: none

TITLE: Investigation of internal stresses in polymer coatings

SOURCE: Vsesoyuznaya konferentsiya po polyarizatsionno-opticheskomu metodu issledovaniya napryazheniy. 5th, Leningrad, 1964. Polyarizatsionno-opticheskiy metod issledovaniya napryazheniy (Polarizing-optical method of investigating stresses); trudy konferentsii. Leningrad, Izd-vo Leningr. univ., 1966, 269-273

TOPIC TAGS: stress, stress analysis, plastic coating, optic method, adhesion, plastic film

ABSTRACT: The adhesion, physical properties and wear of plastic coatings depend on the internal stresses due to variation in the number and distribution of the cohesive and adhesive links between the coating and the substrate. The influence of formation and aging of the coating, its composition and thickness, the composition of the plasticizer, the nature of the substrate, and of other factors on the generation of internal stresses in the coatings is the subject of investigation reported in the article. The internal stresses were determined at the interface of a glass substrate with the particular coating. The internal stresses increase at a constant rate during

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ACC NR: AT7002112

the formation of the film up to a limiting value, and then relax during the storage at room temperature until a certain steady state value is reached. For instance, in the 250 μ thick films the internal stresses reach their maximum value after 4 hrs of formation, but in thicker films the maximum value is reached after 12 to 14 hrs. The speed of stress relaxation is also related to the thickness of the coating, as well as to the absorption of water vapors from the air. The magnitude of internal stresses can be regulated through variation of the composition of the film. Certain types of plastificators can decrease the stresses. The conditions of hardening have a substantial effect on the rate of formation and the number of links due to the evaporation of the thinner and the rate of condensating and polymerizing processes, and therefore, on the generation of internal stresses. The modification of the substrate surface through additives which affect the nature of the links at the interface, can either speed up or slow down the rate of growth of internal stresses. The authors include tabulated data and graphs on the effects of the various factors on internal stresses. Orig. art. has: 6 figures, 2 tables.

SUB CODE: 11,20/ SUBM DATE: 14Jun66/ ORIG REF: 004

Card 2/2

ACC NR: AP6037026 (N) SOURCE CODE: UR/0374/66/000/005/0651/0658

AUTHOR: Grozinskaya, Z. P.; Kadyrov, M. Sh.; Zubov, P. I.

ORG: Institute of Physical Chemistry, Academy of Sciences, SSSR, Moscow (Institut fizicheskoy khimii Akademii nauk SSSR)

TITLE: Relation of the wear resistance of polymer coatings to their physicomechanical properties

SOURCE: Mekhanika polimerov, no. 5, 1966, 651-658

TOPIC TAGS: wear resistance, plastic coating, elastic modulus

ABSTRACT: An experimental study of the wear resistance of a series of polymer coatings exposed to the action of metal counterbodies of various physicomechanical properties has shown an increase in wear with increasing elastic modulus of the polymer coating and a decrease in wear with increasing elastic modulus of the counterbody. The introduction of a filler into the film-forming agent has different effects on the wear resistance of the coatings: mineral fillers increase the modulus and decrease wear, and organic ones decrease both the modulus and wear. The wear resistance of coatings based on ED-5 epoxy resin depends on the type of curing agent and curing time and diminishes with increasing elastic modulus. The magnitude of wear is expressed by a two-term analytical equation which treats the wear of the polymer coating as a function of the counterbody. The magnitude of wear as a function of the physical

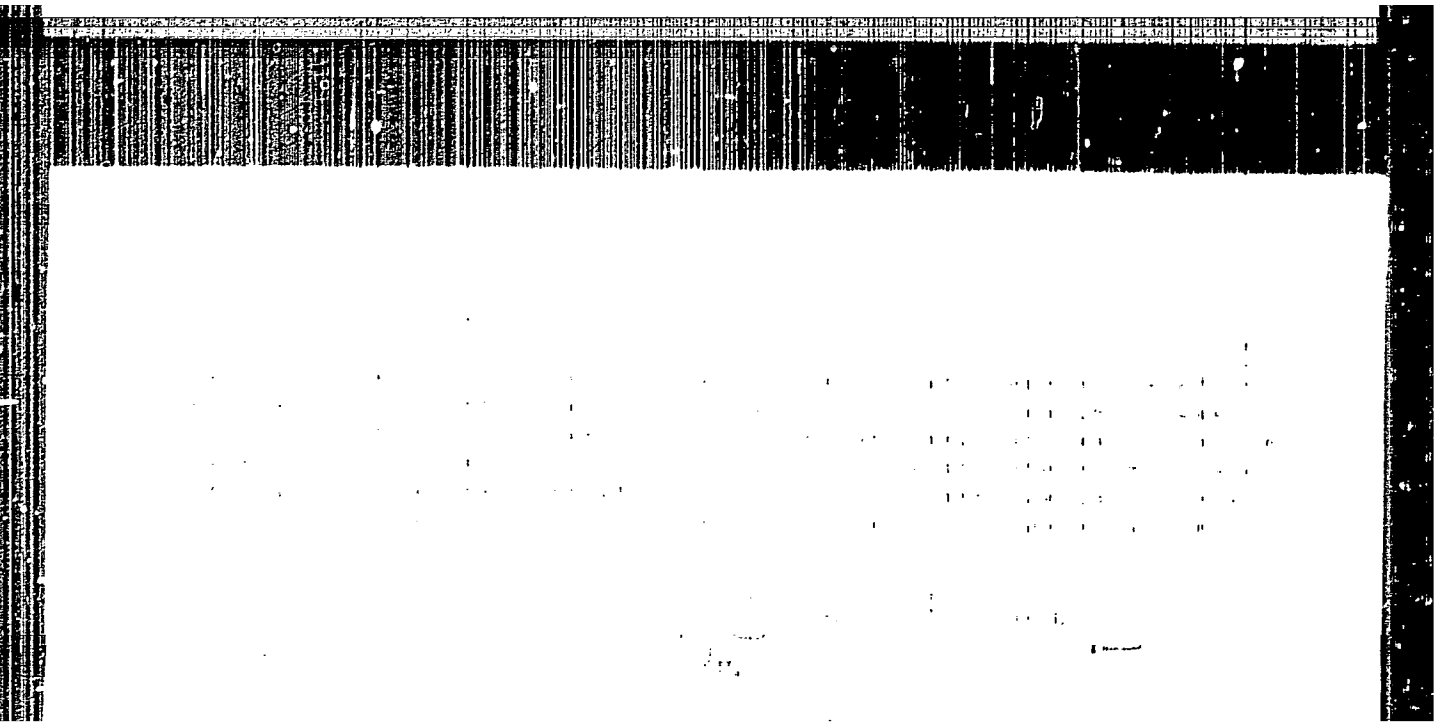
Card 1/2 UDC: 678:539.375

ACC NR: AP6037026

state of the polymer coating is expressed in the form of a three-term equation with parameters corresponding to the vitreous, high-elastic and viscofluid states. Orig. art. has: 7 figures, 1 table and 4 formulas.

SUB CODE: 11/ SUBM DATE: 08Aug65/ ORIG REF: 006/ OTH REF: 001

Card 2/2



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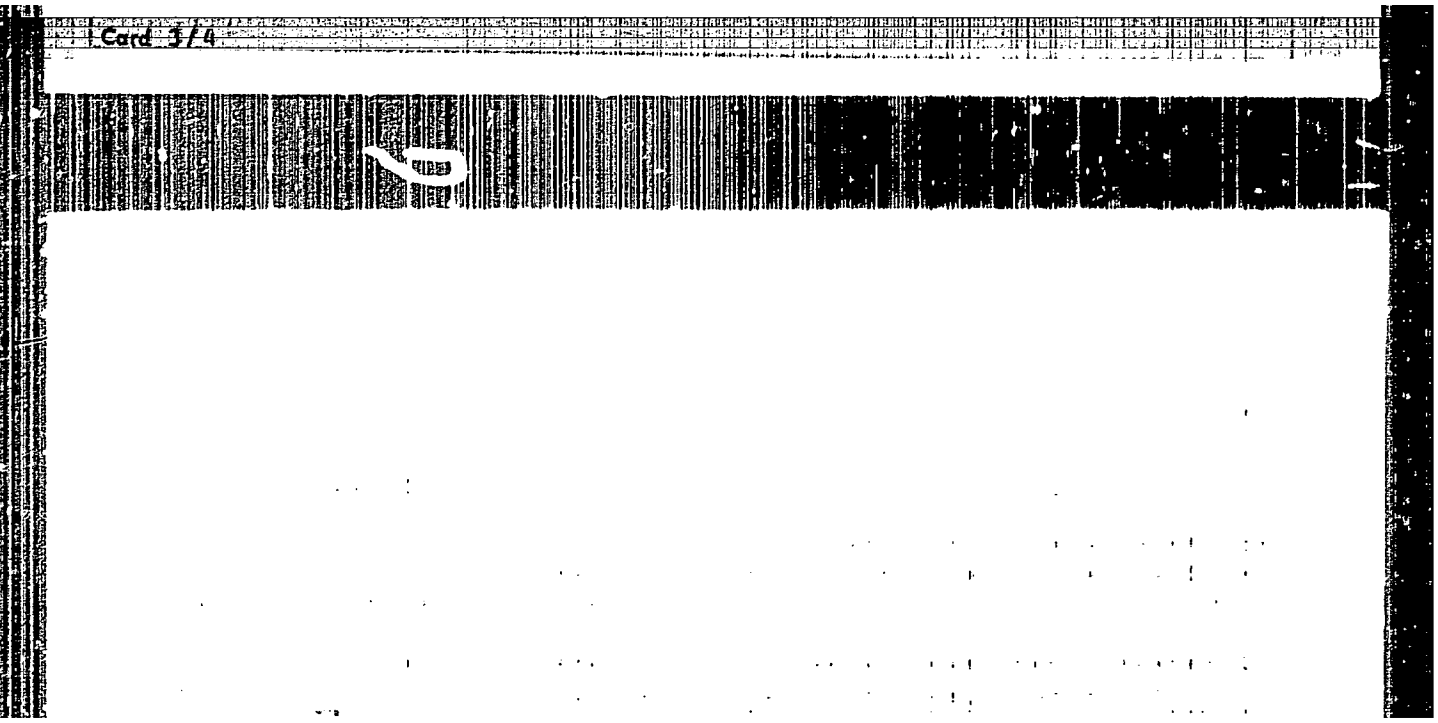

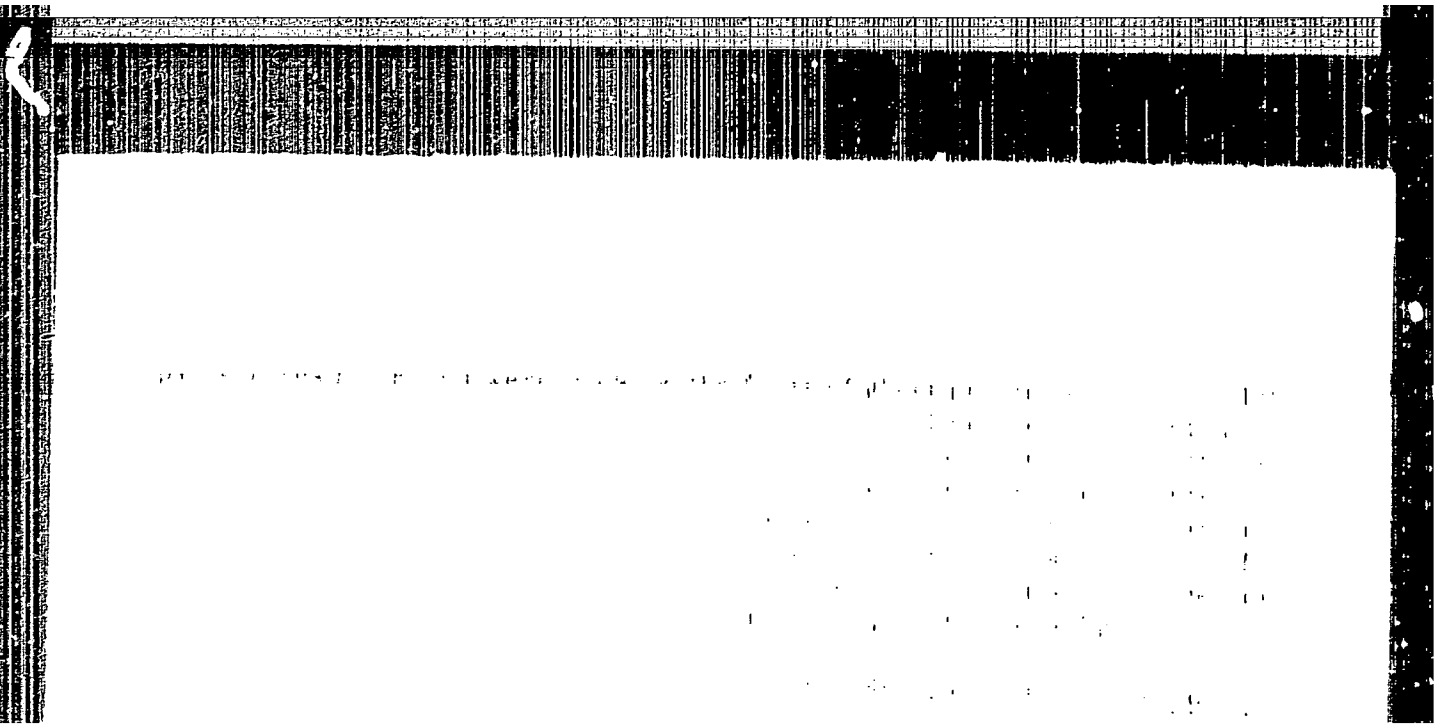

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Card 2/2

[redacted], Ye.A.; [redacted], L.A.

Study of cross-linking in solutions of polyvinyl alcohol. Vysokom.soed. 6 no.5:811-817 My '64. (MIRA 17:8)

1. Institut fizicheskoy khimii AN SSSR.

AVETISYAN, I.S.; KOSPELOVA, K.A.; ZUBOV, P.I.

Properties of polymethacrylate latex films as dependent on the molecular weight. Kolloid.zhur. 25 no.3:278-281 My-Je '63.
(MIRA 17:10)

1. Institut fizicheskoy khimii AN SSSR, Moskva.

GROZINSKAYA, Z.P.; KANZHAROVSKIY, A.T.; ZUROV, P.P.

Thermal aging of nitrocellulose coatings. Koll.zhur. 25 no.3: 299-303 My-Je '63. (MIRA 17:10)

1. Institut fizicheskoy khimii AN SSSR, Moskva.

KANEVSKAYA, Ye.A.; ZUBOV, P.I.; IVANOVA, L.V.; LIPATOV, Yu.S.

Temperature dependence of light scattering and viscosity of polymethacrylic acid solutions. Vysokom. soed. 6 no.6:981-987 Je '64 (MIRA 18:2)

1. Institut fizicheskoy khimii AN SSSR.

ZVERKOV, M.P.; BARASH, A.M.; ZUBOV, P.I.

Heats of precipitation of polyacrylonitrile from solutions. Vysokom. soed. 6 no.6:1012-1015 Je '64 (MIRA 18:2)

1. Moskovskiy institut tonkoy khimicheskoy tekhnologii imeni Lomonosova.

AVETISYAN, I.S.; POSPELOVA, K.A.; ONIKUL, K.E.; ZUBOV, P.I.;
Prinimala uchastiye DREZEL'S, S.S.

Obtaining the copolymer of vinyl acetate with butyl acrylate for emulsion paints. Lakokras.mat. i ikh prim. no.2:13-15 '64.
(MIRA 17:4)

ZUBOV, P.I.; GROZINSKAYA, Z.P.; SANZHAROVSKIY, A.T.

Studying polymeric coatings during the process of their aging.
Lakokras.mat. i ikh prim. no.2:33-36 '64. (MIRA 17:4)

ACCESSION NR: AP4040514 S/0303/64/000/003/0028/0031

AUTHOR: Zubov, P. I ; Sukhareva, L. A.; Paturoyev, V. V.; Koval'chuk, L. M.

TITLE: Influence of fillers on the mechanical and adhesive properties of polyester coatings

SOURCE: Lakokrasochny*ye materialy* i ikh primeneniye, no. 3, 1964, 28-31

TOPIC TAGS: polyester resin, polyester coating, adhesion, filler

ABSTRACT: The object of the study was the polyester resin PN-1. It was found that internal stresses in filled polyester coatings depend on the strength of the bonding (adhesion) between the particles of the filler and the binder. As the content of active filler increased in the polyester coatings, the internal stresses, adhesion of the coatings to the base and compression strength increased while the breaking strength decreased. It was shown that the internal stresses in filled polyester coatings may be reduced by modifying the fillers with surface-active agents causing a decrease in the adhesion between the filler particles and the binder. An increase in the breaking strength of the filled coatings was associated with a 1.5 to 2-fold reduction in internal stresses. When

Card 1/2

ACCESSION NR: AP4040514

the modifier was introduced in amounts exceeding the optimum amount, the adhesion between the filler particles and the binder was weakened considerably, and a sharp decrease in the adhesion of the coating to the base, in internal stresses, and in the strength of the coatings took place.

ASSOCIATION: none

SUBMITTED: 00 DATE ACQ: 06Jul64 ENCL: 00

SUB CODE: OC,MT NO REF SOV: 003 OTHER: 000

Card 2/2

LOMAKIN, A.T.; SANZHAROVSKIY, A.T.; ZUBOV, P.I.

Studying the physicomechanical properties of PE-220 lacquer coatings in the process of their formation. Lakokras. mat. i ikh prim. no.4:29-32 '63. (MIRA 16:10)

GROZINSKAYA, Z.P.; SANZHAROVSKIY, A.T.; ZUBOV, P.I.

Thermal aging of polyester coatings. Koll.zhur. 25 no.5:505-511 S-O '63. (MIRA 16:10)

1. Institut fizicheskoy khimii AN SSSR, Moskva.

ZUBOV, P.I.; GROZINSKAYA, Z.P.; SANZHAROVSKIY, A.T.

Effect of the duration of heating on the deformation properties of polymer films. Koll.zhur. 25 no.5:533-536 S-O '63. (MIRA 16:10)

1. Institut fizicheskoy khimii AN SSSR, Moskva.

BABUSHKIN, A.A.; GOLIKOVA, V.S.; KRYLOVA, L.M.; KIMEL'FEL'D, Ya.M.; ZUBOV, P.I.

Use of infrared spectrometry in studying the kinetics of the formation of polymer coatings. Izv. AN SSSR. Ser. fiz. 27 no.7:978-980 '63. (MIRA 16:8)

1. Institut fizicheskoy khimii AN SSSR.
(Solid film) (Spectrum, Infrared)

KANEVSKAYA, Ye.A.; LIPATOV, Yu.S.; ZUBOV, P.I.

Effect of addition agents on the structural viscosity of concentrated solutions of polymethacrylic acid. Vysokom.soed. 5 no.4:587-592 Ap '63. (MIRA 16:5)

1. Institut fizicheskoy khimii AN SSSR i Institut obshchey i neorganicheskoy khimii AN BSSR.
(Methacrylic acid) (Viscosity)

ZUBOV, P.I.; SANZHAROVSKIY, A.T.; DYL'KOV, M.S.

Investigating the adhesion of polymer coatings by means of various methods. Lakokras.mat. i ikh prim. no.2:48-55 '63. (MIRA 16:4)
(Adhesion)
(Protective coatings--Testing)

L 11102-63 EPR/EWT(l)/EPF(c)/EWT(m)/BDS AFFTC/ASD Pab-4/Pr-4/Pt-4 RM/WW

S/032/63/029/005/016/022

AUTHORS: Grozinskaya, Z. P., Kiselev, M. R. and Zubov, P. I.

TITLE: Method of determining wear of polymeric coatings

PERIODICAL: Zavodskaya laboratoriya, v. 29, no. 5, 1963, 610

TEXT: A method of determining the wear resistance of polymeric coatings and films is proposed, based on a combination of friction -- sliding to-and-fro motion and vibrating motion of a rubbing body in a direction perpendicular to the abraded surface. This was accomplished with an electrical device which is described; the wear on a given test piece varied linearly with the time, and the results of tests of several materials agreed with results obtained by other methods. There is one figure.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry of the Academy of Sciences USSR)

ja/

Card 1/1

L 12979-63 EPR/EWP(1)/EPF(c)/EWT(m)/BDS AFFTC/ASD Pg-4/Pr-4/Pe-4 RM/WW
ACCESSION NR: AP3000524 S/0020/63/150/002/0359/0360

AUTHOR: Zubov, P. I.; Sukhareva, L. A.; Smirnova, Yu. P.

TITLE: Influence of internal stresses on "longevity" of polymer coatings

SOURCE: AN SSSR. Doklady, v. 150, no. 2, 1963, 359-360

TOPIC TAGS: internal stresses, polymer coatings, aging

ABSTRACT: Dependence of duration on the adhesive stress of polyester coatings has been measured by optical method using automatic recording apparatus, described by P. I. Zubov and L. A. Lopilkina (Vestnik AN SSSR, no. 3, 45, 1962). Authors conclude by stating that there is a linear relationship between the duration of adhesion of a coating and internal stresses during a change in the sublayer's stresses within the limits from [illegible] kilograms per square cm. Orig. art. has: 2 figures and 1 formula.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry, Academy of Sciences SSSR)

SUBMITTED: 24Jan63 DATE ACQ: 12Jun63 ENCL: 00
SUB CODE: CH NO REF SOV: 007 OTHER: 001
Card 1/1

SUKHAREVA, L.A.; SMIRNOVA, Yu.P.; ZUBOV, P.I.; ZAMOTOVA, A.V.; KHVILIVITSKIY, R.Ya.

Internal stresses in reinforced systems based on polyester acrylate binding agents. Plast. massy no.10:31-34 '65. (MIRA 18:10)

(A) L 13075-66 EWT(m)/EWP(v)/EWP(j)/T/EWP(t)/EWP(b)/EWA(h) IJP(c) JD/
WW/RM

ACC NR: AP5028915 SOURCE CODE: UR/0020/65/165/003/0626/0628 64/8

AUTHOR: Kabanov, V. Ya.; Grozinskaya, Z. P.; Zubov, P. I.; Spitsyn, Vikt. I. (Academician)

ORG: Institute of Physical Chemistry, Academy of Sciences SSSR (Institut fizicheskoy khimii Akademii nauk SSSR)

TITLE: The study of adhesion of polyethylene coatings on aluminum bases during irradiation

SOURCE: AN SSSR. Doklady, v. 165, no. 3, 1965, 626-628

TOPIC TAGS: adhesive bonding, polyethylene plastic, protective coating, irradiation effect, ADHESION, ELECTRON BEAM

ABSTRACT: It was found earlier by the authors (Vysokomolek. soyed., in print) that prolonged low intensity irradiation of polyethylene coatings results in a considerable increase in adhesion. The present paper describes the direct investigation of such adhesion on samples subjected to a beam of accelerated electrons. Samples were prepared from nonstabilized low-pressure polyethylene deposited by melting on 50μ-thick aluminum foil supports. The heating lasted 10 min. at 230C with a subsequent application of 6 kg/cm^2 of pressure. Results are summarized on Table 1.

UDC: 541.6

Card 1/3

L 13075-66

ACC NR: AP5028915

TABLE 1. Adhesion of polyethylene coatings to aluminum supports subjected to irradiation (samples were prepared three days prior to the tests).

NO. OF TEST	DOSE INTENSITY, X 10^{-4} RAD/SEC	IRRADIATION TIME PRIOR TO THE ADHESION DETERMINATION, MIN	ADHESION, KG/CM UNDER BEAM: WITHOUT CHARGE REMOVAL	ADHESION, KG/CM UNDER BEAM: WITH CHARGE REMOVAL	BEAM CURRENT, μA	BEAM TURNED OFF: WITHOUT CHARGE REMOVAL IMMEDIATELY AFTER TURNING OFF THE BEAM	BEAM TURNED OFF: WITH CHARGE REMOVAL IMMEDIATELY AFTER TURNING OFF THE BEAM
1	2,7	1	1	1	0,7	—	—
2	4,5	1	1	1	1,45	—	1
3	6,2	1	1	—	—	1	1
4	8,9	1	1	1	2,65	1	—
		0,5	1				
5	4,5	2	1	—	—	—	—
		5	1			1	

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L 13075-66

ACC NR: AP5028915

The independence of adhesion of dose intensity indicates that the Al-O-R and Al-R chemical bonds play no significant role. The analysis of the data indicate that the basic assumptions of the electrical theory of adhesion cannot be used for the explanation of the influence of irradiation on adhesion between polyethylene and aluminum foils. Orig. art. has: 2 figures and 1 table.

SUB CODE: 07,20,11/ SUBM DATE: 15May65 / ORIG REF: 002 / OTH REF: 002

Card 3/3 DR

ZUBOV,P.S., inzhener; MALOLETKOV,Ye.K.

Experience with centralized operation of building machinery. Mekh. trud.rab.9 no.9:34-36 S'55. (MLRA 8:12)
(Building machinery--Maintenance and repair)

GURVICH, Mark Arkad'yevich, prof.; ZUBOV, P.V., red.; LEBEDEVA, V.I., tekhn. red.

[Suspension of the statute of limitations in Soviet civil law] Presekatel'nye sroki v sovetskom grazhdanskom prave. Moskva, Vses.iurid.zaochnyi in-t, 1961. 78 p. (MIRA 15:1)
(Limitation of actions)

BAGRINOVSKIY, A.D., inzh.; ZUBOV, R.V., inzh.; SHPAAK, G.V., inzh.

Electric model used in designing mine ventilation systems.
Bezop. truda v prom. 3 no.2:23-25 F '59. (MIRA 12:2)

1. Institut gornogo dela AN SSSR.
(Mine ventilation)

ZUBOV, S.A.

Siberian pine in the Ural Mountain region. Priroda 51 no.2:108-110 F '62. (MIRA 15:2)

1. Ural'skiy lesotekhnicheskiy institut, Sverdlovsk.
(Ural Mountain Region--Pine)

ZUBOV, S.A.

Cedar grove. Priroda no.6:84 Je '60. (MIRA 13:6)

1. Ural'skiy lesotekhnicheskiy institut, Sverdlovsk.
(Nizhnyaya Salda--Cedar)

ZUBOV, S.A.; LUGANSKIY, N.A.

Siberian pine in the vicinity of Sverdlovsk. Bot. zhur. 47 no.7:1006-1009 Jl '62. (MIRA 15:9)

1. Ural'skiy lesotekhnicheskiy institut i Opytnaya stantsiya po ozeleneniyu gorodov Ural'skogo nauchno-issledovatel'skogo instituta Akademii kommunal'nogo khozyaystva, Sverdlovsk.
(Sverdlovsk Region—Pine)

DETLAF, T.A.; ZUBOV, S.E.

Correlating the duration of the periods of maturation and embryonic development in the sturgeons Acipenser güldenstaedtii and A. stellatus. Dokl. AN SSSR 143 no.3:746-748 Mr '62. (MIRA 15:3)

1. Institut morfologii zhivotnykh im. A.N.Severtsova AN SSSR. Predstavleno akademikom Yu.A.Orlovym.
(Sturgeons)(Temperature--Physiological effect)

ZUBOV, S. M.

ZUBOV, S. M. - "Geomorphological Structure of the Yakh-Su River Valley in Connection With Certain Features of the Topography of South Pridarvaz'ya." Sub 26 Apr 52, Moscow Oblast Pedagogical Inst. (Dissertation for the Degree of Candidate in Geological and Mineralogical Sciences).

SO: Vechernaya Moskva January-December 1952

ZUBOV, S.M.

Concerning the term "landshaft" in the secondary school. Geog. v shkole 18 no.1:65-66 Ja-F '55. (MLRA 8:3)
(Geography--Terminology)

SOV/12-91-3-12/14

3(5)

AUTHOR: Zubov, S.M.

TITLE: The Organization of the Training at the Departments of Geography of the Pedagogical Institutes in China

PERIODICAL: Izvestiya VGO, 1959, Vol 91, Nr 3, pp 298-299 (USSR)

ABSTRACT: The author was in Red China from 1954 to 1956. He reports on the training methods used at the colleges of geography annexed to the Institutes of Pedagogy in China. Pedagogical institutes of Shanghai, Hua Tung), Kanton (Kuang-chou), and Nanking are named. Papers of the lecturers are reproduced prior to the lecture. Students attend 36 lectures per week and are required to work 3 hours daily except Saturday. Colleges of geography are usually equipped with several workshops, e.g. methodology of geography, geography of soils, geography of plants, cartography

Card 1/2

TESLER, L.; ZUBOV, V.

Remote control of VTI-15 grain dryers. Muk.-elev.prom. 26 no.2:13-15 F '60. (MIRA 13:6)
(Grain--Drying) (Remote control)

ZUBOV, V., inzhener.

Mechanized ore extraction in developing inclined shaft entrances.
Mast.uglia 5 no.1:15 Ja '56. (MLRA 9:5)
(Sakhalin--Strip mining)

ZUBOV, V.; SAL'NIKOV, Yu.

Automatic unit for anodizing aluminum parts. Mashinostroitel' no.12:11 D '61. (MIRA 14:12)
(Electroplating)

24.3420

66374

SOV/120-59-5-27/46

AUTHORS: Zubov, V.A., Petrash, G.G. and Sushchinskiy, M.M.

TITLE: A Double-beam Spectrometer for the Study of Combinational (Raman) Scattering of Light

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 5, pp 119 - 120 (USSR)

ABSTRACT: A photo-electric spectrometer is described, which uses a diffraction grating having a dispersion of 5.5 Å/mm. The instrument works both in the single-beam and double-beam modifications. In the latter case, the ratio of the intensities of lines in the spectrum under investigation to the intensity of the exciting line is recorded, which excludes instabilities in the photomultiplier and the light source. The instrument is illustrated in Figure 1. In this figure, 1111 is the main beam, 2222 is the comparison beam, P is the diffraction grating, O_1 and O_2 are the collimator objectives, S_1 and S_2 are the input and output slits, ФЭУ is the photomultiplier, Л is a mercury lamp, K is a container with a scattering substance, OK is an optical wedge, M is an interrupter,

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A Double-beam Spectrometer for the Study of Combinational (Raman) Scattering of Light

ПУ is a pre-amplifier, У is a selective amplifier, СД is a synchronous detector, Ф is a photo-resistor which is used to obtain signals which synchronise the work of the detector, $У_{пр}$ controls the reversing motor, З is a recording device (pen recorder), $Л_1$ is a condenser and $Л_2$ is a lens which focuses the light beam onto the photomultiplier photo-cathode.
A change in the photomultiplier voltage of ± 55 V, which in the single-beam set-up gives a change in the recorded signal by a factor of 2, has no effect on the double-beam apparatus. Figure 2 shows the 4358 Å mercury line obtained with the apparatus. The curve on the left shows the line under normal working conditions of the lamp.
There are 3 figures and 2 Soviet references.

Card 2/3

66374

SOV/120-59-5-27/46

A Double-beam Spectrometer for the Study of Combinational (Raman) Scattering of Light

ASSOCIATION: Fizicheskiy institut AN SSSR
(Physics Institute of the Ac.Sc., USSR)

SUBMITTED: August 21, 1958

Card 3/3

24(7)

AUTHORS: Zubov, V.A., Petrash, G.G. and Sushchinskiy, M.M.

TITLE: Some Applications of a Spectrometer with High Dispersion in Molecular Analysis Using Raman Spectra (Nekotoryye primeneniya spektrometra s bol'shoy dispersiyey dlya molekulyarnogo analiza po spektram kombinatsionnogo rasseyaniya sveta)

PERIODICAL: Optika i spektroskopiya, 1959, Vol 6, Nr 6, pp 827-829 (USSR)

ABSTRACT: The authors describe a spectrometer for study of Raman spectra constructed at the Optical Laboratory of the Physics Institute, Academy of Sciences, U.S.S.R. A plane diffraction grating was used as the dispersing element. It was an echelette grating with 600 lines/mm, ruled area 140 x 150 mm, and it was prepared at the State Optical Institute. Collimators had objectives made at the State Optical Institute (focal length 1600 mm; relative aperture 1:12). The instrument was meant for use in the second order in the blue region and had dispersion of 5 Å/mm. A photomultiplier FEU-17 was used as a receiver. A PRK lamp or a low-pressure lamp could be used as a source. There are two ways of using this spectrometer. One is the 2-beam method described in detail earlier (Ref 4). In this case one records the ratio of the light signal coming from a cell with the scattering substance to the light signal proceeding directly from the lamp. The other way is the so-called differential method shown

schematically in Fig 1. Light from two different sources is directed alternately by a rotating mirror onto the entry slit of the spectrometer. When the intensities of the two light beams are the same the photomultiplier current is unmodulated and, therefore, blocked by a selective amplifier tuned to the modulation frequency. When one of the light beams is more intense the resulting photocurrent has an alternating component which is amplified and recorded. The spectrometer can be used to study line shapes (Ref 2) and structure of bands consisting of closely spaced lines. Other possible applications include: (i) studies near the wavelength of the exciting light (Fig 2), (ii) studies of mixtures (subtraction of the spectrum of one component from the spectrum of the mixture), (iii) studies of small changes of line widths and intensities. There are 2 figures and 5 references, 4 of which are Soviet and 1 English.

ZUBOV, V.A.

Differentiation of spectra. Opt. i spektr. 11 no.2:275-277 Ag '61. (MIRA 14:8)
(Spectrum analysis)

S/051/62/013/006/017/027
E039/E120

AUTHOR: Zubov, V.A.

TITLE: A study of the degree of depolarisation of Raman lines as a function of the exciting light frequency

PERIODICAL: Optika i spektroskopiya, v.13, no.6, 1962, 861-862

TEXT: This work, which is a continuation of earlier experiments, is important in investigating the nature of the Raman effect and provides information on the structural tensor derived from polarisation. Measurements were made on the degree of depolarisation in the ultraviolet region near the self absorption bands for a series of materials (excitation lines 3132, 3126 and 3021 Å). A grating spectrometer with a dispersion of 6.5 Å/mm in the second order and 4.3 Å/mm in the third order was used, together with a ФЭУ-18 (FEU-18) photomultiplier as a detector. The apparatus together with the polaroids was calibrated using the CCl_4 lines. Results obtained for the above ultraviolet lines and also for the 4358 and 5461 Å lines are fully tabulated. The degree of depolarisation ρ is given by:

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A study of the degree of ...

S/051/62/013/006/017/027
E039/E120

$$\rho = \frac{6g'^2}{5b'^2 + 7g'^2}$$

where b' and g' are tensors derived from polarisation β_{ik}. This is defined in terms of the π and σ electrons, as follows:

$$\beta_{ik} = \beta_{ik}(\pi) + \beta_{ik}(\sigma)$$

The dependence of ρ on the frequency ν of the exciting light is estimated qualitatively. At low and high values of ν the depolarisation ρ is almost independent of ν, while at intermediate frequencies ρ is proportional to ν, the contribution due to π-electrons increasing with increase in ν. In order to observe the change in ρ with ν the following conditions must be fulfilled: 1) measurements must be made near to electron absorption band; 2) the degree of depolarisation of the investigated lines must not be too great. Reasonable agreement is obtained with the results of other workers.

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A study of the degree of ... S/051/62/013/006/017/027
E039/E120

Results are presented for CCl_4, benzene, toluene, pentane-1, pentadiene-1,3, 2 methyl butadiene-1,3 and 1,2-disililethane.. There are 1 figure and 1 table.

SUBMITTED: May 18, 1962

Card 3/3

ZUBOV, V. A.

Degree of depolarization of Raman spectrum lines as a function of the exciting light frequency. Opt. i spektr. 13 no.6: 861-862 D '62. (MIRA 16:1)

(Raman effect) (Polarization(Light))

SUSHCHINSKIY, M. M.; ZUBOV, V. A.

Relation between Raman spectra and electron absorption spectra.
Opt. i spektr. 13 no.6:766-774 D '62. (MIRA 16:1)

(Raman effect) (Electrons—Spectra)

S/051/63/014/004/023/026
E039/E480

AUTHOR: Zubov, V.A.

TITLE: Dependence of the intensity of Raman lines in the CH group on the frequency of exciting light

PERIODICAL: Optika i spektroskopiya, v.14, no.4, 1963, 578-579

TEXT: This is a continuation of a program of work on the subject and is carried out in the range 5461 to 3021 Å using a grating spectrograph in the second and third orders. CH group lines were selected as it is expected that σ-electrons will play the dominant role. The results show that the intensity of the 2852 cm^{-1} line of cyclohexane changes with the fourth power of the frequency of the exciting light ($\sim \nu^4$). Unsaturated and aromatic hydrocarbons are investigated and corrections are applied for changes in the absorption coefficient, refractive index and the effect of photochemical reactions. Experimental error is not more than 10% but because of corrections the sum of errors in the worst case is about 30%. The ratio of the intensities of the lines in the CH group does not change with ν the frequency of exciting light. For unsaturated compounds with unsatisfied bonds, such as pentane-1

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and hexadione-1,5 there is some increase in intensity of the CH lines with increase in exciting quanta, but more slowly than the increase in intensity observed with the double C = C bond. Unsaturated compounds with satisfied bonds show a faster increase in intensity but the intensity of the lines connected with the vibration of the double bond increases more strongly. With benzene no increase in intensity of the CH lines is observed; with toluene there is some increase. The results of this class of materials agree with the literature. The observed increase in intensity of the CH lines shows the essential role of the π-electron. In a theoretical examination of the problem it is necessary to take into account higher electron states. The contribution of these higher levels may produce a deviation from the proportionality between the intensity of the Raman lines and the coefficient of absorption, resulting in a slower increase in intensity of the lines. There is 1 table.

SUBMITTED: September 28, 1962

Card 2/2

L 10727-63 EWA(k)/EWP(t)/EWT(l)/EWP(b)/EWT(m)/BDS/FBD/T-2/EWG/ES(c)-2/

TITLE: Application of the laser to the study of Raman spectra of dye powders

SOURCE: Zhurnal eksper. i teor. fiziki, v. 44, no. 6, 1963, 2193-2194

TOPIC TAGS: laser applications, Raman spectra, dye powders

ABSTRACT: A 6943 Å ruby laser has been applied to the study of Raman spectra in dye powders. A spectrograph with a diffraction grating of 600 lines/mm was used in the investigation. A lens focusing the laser beam on the powder samples, which were placed directly before the slit of the spectrograph, [illegible] low-power ruby laser with [illegible] pumping power was used. 50—100 flashes were required for photographing the emission spectrum of .07—0.. mm, which constitutes 9—12 cm^{-1} in the given spectral region. Tests conducted with a number of different powders including 4, 4'-azoxyanisole

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L 10727-63

ACCESSION NR: AP3003161

3

(bright yellow) and anisal-para-aminoazobenzene (red) showed that lasers are quite suitable for studying Raman spectra of dye powders. "The authors thank M. D. Galanin and A. M. Leontovich for the use of their ruby laser." Orig. art. has: 1 figure.

ASSOCIATION: Fizicheskiy institut im. P. N. Lebedeva Akademii nauk SSSR (Institute of Physics, Academy of Sciences SSSR)

SUBMITTED: 12Apr63 DATE ACQ: 23Jul63 ENCL: 00

SUB CODE: 00 NO REF SOV: 000 OTHER: 001

Card 2/2

ACCESSION NR: AP4041128 S/0053/64/083/002/0197/0222

AUTHOR: Zubov, V. A.; Sushchinskiy, M. M.; Shuvalov, I. K.

TITLE: Stimulated Raman scattering of light

SOURCE: Uspekhi fizicheskikh nauk, v. 83, no. 2, 1964, 197-222

TOPIC TAGS: laser, Raman effect, Raman laser, stimulated Raman scattering, Raman laser material

ABSTRACT: The current state of theoretical and experimental work aimed at achieving Raman-effect laser action is presented in a comprehensive review based mainly on Western sources. The principal experimental results are considered for two cases: where the scattering material is located inside and where it is located outside the Fabry-Perot interferometer. In the latter case, particular attention is paid to the types of laser emission falling in the Stokes and anti-Stokes frequency regions. Discussion of the latest experiments is backed up by a theoretical exposition in terms of semiclassical and quantum interpretations of Raman-effect laser action.

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ACCESSION NR: AP4041128

Discussion of Soviet contributions is limited to the work of V. S. Mashkevich, who has previously presented the theory of stimulated Raman scattering in the Stokes region in terms of kinetic equations. The final section of the review deals with Raman-effect laser devices analyzing the work of C. H. Bekker (Zs. Phys. 172, 125, 1963). A footnote to the review mentions the publication of several papers which appeared too late for discussion in the text, including two Soviet works (V. T. Platonenko and R. V. Khokhlov, ZhETF 46,555 (1964); V. M. Fayn and E. G. Yashchin, ZhETF 46,695 (1964)) which treat a number of problems regarding two-photon processes involving Raman-effect laser action. Both papers derive expressions determining the generation threshold of Raman lasers. Orig. art. has: 7 figures, 71 formulas, and 3 tables.

ASSOCIATION: none

SUBMITTED: 00	ATD PRESS: 3063	ENCL: 00
SUB CODE: EC	NO REF SOV: 005	OTHER: 019

Card 2/2

L 1418-66 EWA(k)/FED/EWT(1)/EPF(c)/EEC(k)-2/T/EWP(k)/EWA(m)-2/EWA(h) SOURCE CODE:
IJP(c) WG/WW/GG
ACCESSION NR: AP5021727 UR/0386/65/002/002/0063/0067

AUTHOR: Zubova, N. V.; Sushchinskiy, M. M.; Zubov, V. A.

TITLE: The complex line structure in stimulated Raman scattering of light

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki. Pis'ma v redaktsiyu. Prilozheniye, v. 2, no. 2, 1965, 63-67, and insert attached to p. 65

TOPIC TAGS: Raman scattering, Stokes line, stimulated emission, laser, Raman laser

ABSTRACT: In investigating stimulated Raman scattering in styrene, isoprene, 1,3-pentadiene, benzene, and nitrobenzene the authors observed line splitting in the region of the first Stokes line. This effect was very pronounced at pump powers just above the threshold, when the line was split from 1—2 components into 5—6 components and the separation of the outer components changed from 1—2 to 10—12 cm^{-1}. As the pump power was increased, the number of components and their separation decreased until only one line was observed when the pump power was 2—4 times greater than the threshold power. The splitting of the lines was found to be independent of the nature of the apparatus used and the operating regime of the laser. The effect was attributed to the fact that Raman scattering occurs on molecules moving at a high speed. At a relatively low pump power the formation of a "spark" in the

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L 1418-66
ACCESSION NR: AP5021727

liquid is accompanied by a flow of molecules in several directions. As the pump power is increased, these directions are shifted closer to the plane perpendicular to the incident beam until only one line is observed. It is calculated that in order to cause splitting the velocities of the molecules must be very high (about 10^7—10^8 cm/sec). Orig. art. has: 4 formulas and 2 figures. [CS]

ASSOCIATION: Fizicheskiy institut imeni P. N. Lebedeva Akademii nauk SSSR (Physics Institute, Academy of Sciences, SSSR)

SUBMITED: 25May65 ENCL: 00 SUB CODE: GP, EC

NO REF SOV: 004 OTHER: 002 ATD PRESS: 4099

Card 2/2

L 7021-66 EWA(k)/FBD/EWT(1)/EWP(e)/EWT(m)/EEC(k)-2/EWP(t)/ETI/ EWP(k)/EWA(m)-2/
ACC NR: AP5026319 EWA(h) WH/WG SCTB/IJP(c) SOURCE CODE: UR/0308/65/003/004/0336/0341

AUTHOR: Zubov, V. A.; Sushchinskiy, M. M.; Shuvalov, I. K. 44 44 44

ORG: none

TITLE: An investigation of stimulated Raman scattering

SOURCE: Zhurnal prikladnoy spektroskopii, v. 3, no. 4, 1965, 336-341

TOPIC TAGS: Raman scattering, Stokes component, Raman laser, stimulated emission, laser 25,44

ABSTRACT: An experimental investigation was conducted of stimulated Raman scattering in benzene, bromobenzene, chlorobenzene, toluene, pyridene, o-xylene, styrene, 1,3-pentadiene, 2-methyl-1,3-butadiene, carbon disulfide, carbon tetrachloride, and nitrobenzene. The dependence of the intensity of the first Stokes component on the properties of the scatterer, the concentration of its molecules, and the intensity of the excited light (from a Q-spoiled ruby laser) was investigated. It was established that, unlike spontaneous Raman scattering, the line intensity of stimulated Raman scattering is an exponential and not a linear function of the intensity of the exciting light and the concentration of the scattering molecules. The exponential variation is in agreement with a simplified theory developed by the authors for the case when the intensity of exciting light slightly exceeds the excitation threshold. In the first approximation the inverse of the excitation threshold is a quadratic

Card 1/2 UDC: 535.32

L 7071-66

ACC NR: AP5026319

function of the concentration of the scattering molecules. Orig. art. has: 14 formulas, 3 figures, and 1 table. [CS]

SUB CODE: SS/ SUBM DATE: 20Jan65/ ORIG REF: 002/ OTH REF: 002/ ATD PRESS: 4144

nw

Card 2/2

L 36014-66 EWT(1)/T IJP(c) GG/WW/WG

ACC NR: AP6024513 SOURCE CODE: UR/0386/66/004/002/0052/0054

AUTHOR: Gorelik, V. S.; Zubov, V. A.; Sushchinskiy, M. M.; Chirkov, V. A.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Possibility of observing induced infrared radiation in Raman scattering of light

SOURCE: Zh eksper i teor fiz. Pis'ma v redaktsiyu. Prilozheniye, v. 4, no. 2, 1966, 52-54

TOPIC TAGS: molecular spectrum, Raman scattering, ir radiation, ir quantum generator, stimulated emission, spectral distribution

ABSTRACT: The authors discuss a new mechanism for producing population inversion between vibrational or vibronic levels of molecules. It is shown that if certain conditions for the possible transitions between molecular levels are satisfied, such that one of the levels does not become populated in the case of Raman scattering of light, so that the thermal distribution of the molecules over the vibrational levels may become disturbed and population inversion may occur. The required threshold power is evaluated from the gain per unit length of the transition near the generation threshold, and it is shown by preliminary estimates that the required minimum power is 10^7 W/cm^2 for liquids and 10^4 W/cm^2 for gases. The latter is attainable with a xenon lamp (power ~10^5 W/cm^2), and the estimated molecule density at the upper level

Card 1/2

L 36014-66
ACC NR: AP6024513

turns out then to be 10^{13} cm^{-3}. If a ruby laser is used (power ~10^7 W/cm^2), induced Raman scattering can be observed in liquids, with a quantum yield of several times ten per cent and a molecule density 10^{16} cm^{-3} at the upper level. The proposed excitation mechanism is realizable in principle in crystals, too. Orig. art. has: 1 figure and 2 formulas. [02]

SUB CODE: 17/ 20/ SUBM DATE: 14May66/ ORIG REF: 003/ OTH REF: 003/
ATD PRESS: 5037

Card 2/2 nlc

L 38.21-66 EWT(1)

ACC NR: AP6024868 SOURCE CODE: UR/0056/66/051/001/0101/0107

55
B

AUTHOR: Zubova, N. V.; Kuz'mina, N. P.; Zubov, V. A.; Sushchinskiy, M. M.; Shuvalov, I. K.

ORG: Physics Institute im. P. N. Lebedev, Academy of Sciences SSSR (Fizicheskiy institut Akademii nauk SSSR)

TITLE: Intensity distribution in stimulated Raman scattering spectra

SOURCE: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 51, no. 1, 1966, 101-107

TOPIC TAGS: raman scattering, ~~nonlinear~~ laser optics, laser, light

ABSTRACT: The line intensity of stimulated Raman scattering spectra (SRS) was experimentally investigated as a function of the exciting light intensity. The measurements were conducted in a region of intensities above and below the experimental threshold for a single flash. The intensity distribution in SRS spectra was investigated for several Stokes and anti-Stokes components. The existence of a considerable wing accompanying each component was detected. A structure of the first Stokes component of SRS was found and was investigated in the threshold region and below the threshold. Orig. art. has: 7 formulas and 4 figures. [CS]

SUB CODE: 20/ SUBM DATE: 21Feb66/ ORIG REF: 008/ OTH REF: 002/ ATD PRESS: 5043

Card 1/1

L 30408-66 EWT(1) IJP(c)

ACC NR: AP6017864 SOURCE CODE: UR/0053/66/089/001/0049/0088

59
B

AUTHOR: Zubov, V. A.; Sushchinskiy, M. M.; Shuvalov, I. K.

ORG: Physics Institute im. P. N. Lebedev, AN SSSR (Fizicheskiy institut AN SSSR)

TITLE: Modern trends in Raman spectroscopy 2/

SOURCE: Uspekhi fizicheskikh nauk, v. 89, no. 1, 1966, 49-88

TOPIC TAGS: Raman spectroscopy, laser application, Raman scattering, stimulated emission, SPECTROPHOTOMETRIC ANALYSIS

ABSTRACT: The authors review recent trends in Raman spectroscopy which are only briefly mentioned in previous survey articles. Fundamentally new methods are described for producing and studying Raman spectra. Spectrophotometric systems for registration of Raman spectra are divided into two categories: 1. systems for electrical division of the signals received from the scatterer (the signal to be measured) and those received directly from the excitation source (the comparison signal); 2. systems for optical division. The operating principles of each class of systems are discussed as a basis for explaining their advantages and disadvantages. Methods and equipment are described for photoelectric registration of Raman spectra generated by pulsed excitation and the theoretical superiority of this method over continuous excitation is discussed. The greatest possibilities for practical application of the pulsed

UDC: 535.36

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L 30408-66

ACC NR: AP6017864 0

method are in high-speed Raman spectroscopy. The difference method for recording Raman spectra is considered as well as the registration of spectra which are differentiated with respect to frequency. Equipment and methods using laser technology for producing Raman spectra are described with particular emphasis on the progress which has been made with the improvement of continuous gas lasers. The rapidly developing field of stimulated Raman scattering is discussed and research on this type of scattering by materials in various states of aggregation is reviewed. The present state of the art in experimental technology indicates that stimulated Raman scattering lines may be obtained for nearly any material in any state of aggregation. Theoretical and experimental data are given on the spatial distribution of stimulated Raman scattering together with some of the energy characteristics and nonlinear effects associated with this phenomenon. The latest research in this field has opened up new possibilities for using this type of emission to amplify light signals in a broad spectral range. Orig. art. has: 28 figures, 6 tables, 21 formulas. [28]

SUB CODE: 20/ SUBM DATE: none/ ORIG REF: 023/ OTH REF: 051/ ATD PRESS: 5017

Card 2/2 CC

L 31134-66 EWP(1)/EWT(1)/EWT(m)/EWP(e) RM/WH

ACC NR: AP6012859 SOURCE CODE: UR/0368/66/004/0351/0353

AUTHOR: Berezin, V. I.; Zubov, V. A.; Kats, M. L.; Kovner, M. A.; Sidorov, N. K.; Stal'makhova, L. S.; Sushchinskiy, M. M.; Turbin, Yu. P.; Shubalov, I. K.

ORG: none

54
52
B

TITLE: Intensities and line thresholds of stimulated Raman scattering

SOURCE: Zhurnal prikladnoy spektroskopii, v. 4, no. 4, 1966, 351-353

TOPIC TAGS: laser, stimulated emission, Raman scattering, stimulated Raman scattering

ABSTRACT: The relative values for the threshold I for the intensity of the exciting light necessary to attain stimulated Raman scattering in toluene, chlorobenzene, and pyridene have been measured. Using a theory of SRS developed by P. A. Apanasevich and B. I. Stepanov (Zhurnal prikladnoy spektroskopii, v. 1, 1964, p. 202), the authors derived the following formula

$$I_B/I = (I_\infty/\delta)/(I_\infty/\delta)_B \quad \nu^3_{\beta B}/\nu^3_\beta \quad n^3_B/n^3, \qquad (1)$$

where I_∞ is the integral intensity of the SRS line, δ is the line width, ν_β is the frequency of the scattered light, n is the index of refraction, and the subscript B identifies these quantities for benzene. The experimental values of

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Table 1. Main parameters and oscillation thresholds for SRS

Substance	$\Delta\nu$, cm^{-1}	γ, cm^{-1}	δ, cm^{-1}	I_0/I_{SB}	$I_0/(I_0/\Delta\nu_0)$	n_D	exp. I	cal. I
benzene	992	13411	1,8	1	1	1,50	1	1
1,3-pentadiene	1655	12748	15	1,6	0,2	1,43	0,5	0,25
3-methyl-1,3-butadiene	1638	12766	7	1,3	0,3	1,42	0,5	0,40
carbon disulfide	656	13747	1	1,6	3	1,63	1,6	2,24
styrene	998	13406	2	0,7	0,5	1,55	0,5	0,55
styrene	1602	12801	3	0,9	0,6	1,55	—	0,59
styrene	1634	12769	3	1,6	0,9	1,55	0,9	0,90
toluene	1003	13400	1,6	0,37	0,4	1,50	0,5	0,42
chlorobenzene	1002	13401	1	0,45	0,8	1,52	1	0,76
bromobenzene	1001	13402	1	0,50	0,9	1,56	1,1	0,81
pyridine	992	13411	1,2	0,46	0,8	1,51	1	0,82

1/I for substances investigated in the present paper and in an earlier paper by three of the authors (Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 47, 1964, p. 784) are compared with the theoretical values derived by using formula (1) (see Table 1). The value of 1/I for the line $\Delta\nu = 992\ cm^{-1}$ in benzene was taken to be unity. Since the values of $n(\nu_\beta)$ for a ruby laser source were unavailable, the values of n for the D-line of sodium (n_D) were used in the calculations. Orig. art. has: 17 formulas and 1 table. [CS]

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ZUBOV, V.A.; SUSHCHINSKIY, M.M.; SHUVALOV, I.K.

Induced Raman scattering in mixtures. Zhur. eksp. i teor. fiz. 48 no.1:378-380 Ja '65. (MIRA 18:4)

1. Fizicheskiy institut imeni Lebedeva AN SSSR.

ZUBOV, V.A.; SUSHCHINSKIY, M.M.; SHUVALOV, I.K.

Excitation threshold of induced Raman scattering. Zhur. eksp. i teor. fiz. 47 no.2:784-785 Ag '64. (MIRA 17:10)

1. Fizicheskiy institut imeni P.N.Lebedeva AN SSSR.

ZUBOV, Val'ter Afanas'yevich; KUKIN, G.N., doktor tekhn. nauk, prof., retsenzent; KISELEV, A.K., doktor tekhn. nauk prof., spets. red.; CHUGREYEVA, V.N., red.

[Collection of problems on the study of textile materials] Sbornik zadach po tekstil'nomu materialovedeniiu. Moskva, Legkaia industriia, 1964. 173 p. (MIRA 18:1)

MIZYUK, L.Ya.; ZUBOV, V.G.

Using a computing automatic compensator for direct-current oil prospecting. Razved.i okh.nedr 22 no.12:33-43 D '56. (MLRA 10:2)

1. L'vovskiy institut mashinovedeniya i avtomatiki.
(Prospecting--Geophysical methods) (Electric measurements)

KARANDEYEV, K.B.; MIZYUK, L.Ya.; ZUBOV, V.G.

Using pointer instruments in solving the solution $\alpha = \frac{x}{y}z$. Avtom. kont. i izm. tekh. no.1:21-29 '57. (MIRA 11:6)
(Electronic analog computers)

S/169/62/000/003/028/098
D228/D301

AUTHORS: Karandeyev, K. B., Mizyuk, L. Ya., and Zubov, V. G.

TITLE: Directly measuring the apparent resistance of rocks in direct-current electrical prospecting

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 3, 1962, 26, abstract 3A217 (Dokl. L'vovsk. politekhn. in-ta, 2, no. 2, 1958, 94-97)

TEXT: The authors give the principles of the layout of calculation-determining equipment for directly measuring the apparent resistance, at any value of the coefficient K of the measuring apparatus. The scheme's basic element is a millivoltmeter with an alternating additional resistance. To obtain a high inlet resistance the authors recommend the assembly of the millivoltmeter according to the electronic autocompensator scheme. The meter can be directly graduated in ρ_k values, which ensures scale uniformity. [Abstracter's note: Complete translation.]

Card 1/1

ZUBOV, V. G., Cand of Tech Sci -- (diss) "Certain Problems of the Theory and Calculation of Computer Instruments of the Indicator Type," L'vov, 1959, 16 pp (L'vov Polytechnical Institute) (KL, 2-60, 113)

VESHEV, A.V.; MIZYUK, L.Ya.; PETROV, O.A.; FOKIN, A.F.; CHIR'YEV, A.N.
Prinimali uchastiye: ZUBOV, V.G.; LARIONOV, L.V.; KORCHAGIN, V.I., red.izd-va; BYKOVA, V.V., tekhn.red.

[ESK-1 electronic switch compensator and KSR-1 and KSRM-1 electronic computer compensators for electric prospecting] Elektronnaia elektrorazvedochnaia apparatura ESK-1, KSR-1 i KSRM-1. Moskva, Gos.nauchno-tekhn.izd-vo lit-ry po geol. i okhrane nedr, 1959. 103 p. (MIRA 13:5)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut metodiki i tekhniki razvedki (VITR) (for Veshev, Larionov, Fokin). 2. Institut mashinovedeniya i avtomatiki (IMA) AN USSR (for Mizyuk, Zubov). 3. Osoboye konstruktorskoye byuro Ministerstva geologii i okhrany nedr SSSR (OKB MGiON) (for Chir'yev, Petrov).
(Prospecting--Electronic equipment)

MIZYUK, L.Ya.; GOL'DGEFTER, V.I.; ZUBOV, V.G.

DETA-58 double electric prospecting transitor compensator.
Izv. vys. ucheb. zav.; geol. i razv. 2 no.12:134-139 '59.

1. L'vovskiy institut mashinovedeniya.
(Electric prospecting--Equipment and supplies)

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S/169/62/000/006/043/093
D228/D304

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AUTHORS: Zubov, V. G. and Mizyuk, L. Ya.

TITLE: Computing autocompensator KCR-M(KSR-M)

PERIODICAL: Referativnyy zhurnal, Geofizika, no. 6, 1962, 34, abstract 6A253 (Byul. nauchno-tekhn. inform. M-vo geol. i okhrany nedr SSSR, no. 4 (21), 1959, 37-40)

TEXT: A computing compensator intended for fulfilling division and multiplication operations is described. The device solves equations for the calculation of the impedance (in the range 0.01 - 10^7 ohms) and the reduced gradient (in the range 1 - 1000 mv), the measurement range of the values being thereby varied and controlled automatically. The use of the same variable resistance as the converting unit throughout the measurement range is a peculiarity of the layout; this allows the instrument's communications circuit to be simplified. [Abstracter's note: Complete translation.]

Card 1/1

ZUBOV, V.G.

Use of an indicating meter for solving the equation $P_k = \frac{\Delta U}{U} k$.
Avtom.kont.i izm.tekh. no.4:98-101 '60. (MIRA 13:8)
(Electric resistance)

ZUBOV, V.G.

Characteristics of indicator computers and methods for solving certain problems. Avtom.kont. i izm.tekh. no.5:88-93 '61.
(MIRA 14:11)

(Calculating machines)

ZUBOV, V.G.

Errors in measuring apparent resistance with the MSR-T1 instrument. Avtom.kont. i izm.tekh. no.5:115-118 '61. (MIRA 14:11)
(Electronic instruments)

S/651/61/000/005/008/009
D209/D303

AUTHORS: L.Ya. Mizyuk, and V.G. Zubov

TITLE: Compact transistorized high speed automatic recorder

SOURCE: Akademiya nauk Ukrayins'koyi RSR. Instytut mashynoznavstva i avtomayky, L'viv. Avtomaticheskiy kontrol' i izmeritel'naya tekhnika. No. 5, Kiev, 1961, 135 - 141

TEXT: This paper describes the design and construction of a compact high speed instrument, suitable for recording rapidly changing parameters. The factors that govern the speed of response of the instrument are enumerated. In order to conform with the analytical requirements for optimum operation, all the moving parts are made of light materials: ball bearings are used in the pen carriage. The instrument operates at 400 cycles. A 1-watt, 2-phase servomotor with a hollow rotor is used. The synchronous speed reaches 18000 r.p.m. Thus high reduction ratio in the gear train can be used which decreases the moment of inertia of the load applied to the shaft. The circuit diagram of the system

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is shown. The speed of response depends largely on the reduction gear. The optimum gear ratio for the above instrument was found empirically. The gears have an involute profile. The error signal is converted to 400 cycles by means of a transistor chopper operated by a 400 cycle power oscillator. The residual voltage of the converter with matched transistors does not exceed 20 - 25 μV. The gain of the amplifier is around 250,000, threshold sensitivity of the order of 20μV. The circuit is described in detail. In order to furnish the instrument with the required dynamic characteristic (degree of overshoot and magnitude of error in a given range) an elastic negative feedback is added. This increases the damping. This method is superior to that using a tachogenerator since it eliminates blacklash and need for phasing. The chart has a spring drive. The operation is stable in the temperature range of 0 - 40°C. The span is 0 - 20μV; the basic error of measurement and recording is not greater than 1% of the span; speed of response < 0.2 sec. with a chart 105 mm wide. Power is obtained from a 6 volt accumulator or 400 cycle mains. The instrument can be fixed or portable. It can be used with a number of measuring points inserted periodically into the same recorder.

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S/651/61/000/005/008/009
Compact transistorized ... D209/D303

There are 4 figures, 1 table and 8 references: 7 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: J. Najork, Transistorized supply for mobile radio, Radio and TV news, September 1957 p. 56 - 57.

SUBMITTED: October 1, 1960

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