

SHISHKIN, N.I.

Providing a steady personnel for the northern regions of the
country. Probl. Sev. no.6:18-24 '62. (MIRA 16:8)

1. Nauchno-issledovatel'skiy institut truda Gosudarstvennogo
komiteta Soveta Ministrov SSSR po voprosam truda i zarabotnoy
platy.

(Russia, Northern--Labor supply)

LAZUTKIN, Ye.S.; RUSANOV, Ye.S.; EYDEL'MAN, R.A.; TRUBNIKOV, S.V.; KAPLAN,
I.I.; ZAGORODNIKOV, M.I.; GOL'TSOV, A.N.; TATARINOVA, N.I.; SONIN,
M.Ya.; SHISHKIN, N.I., doktor geogr.nauk; ANTOSENKOV, Ye.G.;
ZHYMKHOVA, I.I.; KOSYAKOV, P.O.; MATROZOVA, I.I.; ZELENSKIY, G.N.;
SEMENKOV, Ya.S.; ZALKIND, A.I., red.; RUSANOV, Ye.S., red.; SHTEYNER,
A.V., red.; MIKHAL'CHENKO, N.Z., red.; GERASIMOVA, Ye.S., tekhn. red.

[Manpower of the U.S.S.R.; problems in distribution and utilization]
Trudovye resursy SSSR; problemy raspredeleniia i ispol'zovaniia. Pod
red. N.I.Shishkina. Moskva, Izd-vo ekon.lit-ry, 1961. 243 p. (MIRA 14:12)

Moscow. Nauchno-issledovatel'skiy institut.
(Manpower)

SHISHKIN, Nikolay I., red.

[Labor resources of the U.S.S.R.; problems of distribution and exploitation] Trudovye resursy SSSR; problemy raspredeleniia i ispol'zovaniia. Moskva, Ekonomizdat, 1961. 246 p.

(MIRA 15:10)

(Labor supply)

SHISHKIN, N. I.

"Methods of effective utilization of manpower resources"

report to the Ministry of the USSR State Planning Commission on the
Application of Science and Technology for the Benefit of the Labor
Developed under the direction of the Ministry, 4 10 Feb 63

F

12

5785. PRINCIPLES GOVERNING THE PRODUCTION OF LUBRICANTS WITH SMALL VISCOSITY TEMPERATURE COEFFICIENTS. Kobeko, PP and Shishkin, NI (symp. visc. liquids and colloids acad. sci. u.s.s.r., 1944, 2, 161-166; j. inst. petrol. 1945, 31, 410A) It is pointed out that the mixing of similar liquids has little effect in improving the viscosity temperature coefficient of the mixture, as compared with that of the components. If, however, the solut has a M.W. which is very great compared with that of the solvent, then the change in viscosity with temperature is similar to that of the latter, which in the case of non viscous solvents is very small. Results are given on measurements of the viscosities of solutions of polystyrene (MW = 400,000) and synthetic rubber in toluene and turpentine, respectively over the temperature range -80 to +100 C. Whilst an ordinary lubricating oil changes in viscosity by 10^{10} times within this temperature interval, the change in the case of the solutions examined is only about 10^2-10^3 times. Results are also given for a mixture of rubber, turpentine and transformer oil.

ASB 35A METALLOGICAL LITERATURE CLASSIFICATION

TECHNICAL

ENGINE

ENGINE

0	1	2	3	4	5	6	7	8	9	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z
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SHISHKIN, N. I.

Lobko, P. E., Kuvshinski, S. V., and Shishkin, N. I.

The amorphous state. XIX. Temperature dependence of the viscosity of liquids. J. Tech. Phys. (U.S.S.R.)

Vol. 14, 1944, pp. 3-9

Abstracted in: Chem. Abs., Vol. 39, 1340²

The log of viscosity is plotted as a function of temp. for very different substances: ethers, alcs., glycerol, org. glasses, B₂O₃, glass SiO₂, molten salts, molten metals, air. All curves have a similar trend; they are flat for low-melting, steep for high-melting products. In a complete system the viscosity curve of the liquid drops (neg. temp. coeff.) to a viscosity of 10⁻¹ to 4 X 10⁻⁴ poises/cm² at the crit. temp., reverses to the opposite direction (pos. temp. coeff. of viscosity in a gas). It is believed possible to develop a general theory for all liquids.

CA

PROCESSES AND PROPERTIES INDEX

2

The amorphous state. XX. Principles of development of heavy oils with small temperature dependence of their viscosity. P. P. Kobeko and N. I. Shishkin. *J. Tech. Phys.* (U.S.S.R.) 14, 10-17(1944).—To ensure satisfactory lubrication in a temp. range from -50° to 100° it is necessary to develop lubricants with a small temp. coeff. of viscosity and a viscosity of some 8-12 poises. The authors examd. solns. of high-mol. substances in low-mol. solvents and found that the viscosity increased considerably, the temp. coeff. remaining small. Test results of $\ln \eta$ as a function of temp. (range -80° to 80°) are represented in 5 graphs covering: (1) pyridine and 10% soln. of styrene in pyridine; (2) toluene, 1% soln. of styrene (mol. wt. 100,000) in toluene, 10% soln. of styrene (mol. wt. 100,000) in toluene, 10% soln. of styrene (mol. wt. 4000) in toluene; (3) turpentine and 10% soln. of Na butadiene rubber in turpentine; (4) transformer oil and 5% soln. of Na butadiene rubber in transformer oil; (5) 17% turpentine and 83% transformer oil and a 0.5% soln. of Na butadiene rubber in this mixt. S. Pakswar

ASB-SLA METALLURGICAL LITERATURE CLASSIFICATION

E-2

RECON: 5191314

RECON: 50114

147082 * 1

147082 * 1

RECON: 5191314

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147082 * 1

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RECON: 50114

Solutions of polymers with linear structure. I. Influence of volumetric thermal expansion on the viscosity of solutions. B. V. Kuvshinskii (Phys. Tech. Inst., Acad. Sci., Leningrad). *J. Tech. Phys. (U.S.S.R.)* 14, 747-50 (1944).—When conclusions on the length and rigidity of polymer mols. are derived from the temp. coeff. of the intrinsic viscosity, this coeff. should be calcd. for a const. vol. concn. (mols. per l. at the test temp.). The coeff. calcd. for a const. wt. concn. c (mols. per kg.) differs increasingly from the correct one, $c \rightarrow$ more the relative viscosity η varies with concn. A convenient equation for c and η is $\log \eta = ac + bc^2$. II. Temperature dependence of viscosity. B. V. Kuvshinskii and N. I. Shakhin. *Ibid.* 757-63.—The relative viscosity of polymer solns. at a const. c and different temps. is expressed by $\log \eta = \log a + n \log \eta_0$, η_0 being the viscosity of the solvent at the test temp., and a and n const. From the expts. of K. and S. n is 0.0 for polyisobutylene in spindle oil, 0.041 for butadiene rubber in machine oil (both within the range 0-100°), 0.13 for butadiene rubber in kerosene (from -68° to 68°), 0.13 for 1% polystyrene in toluene (from -83° to 81°), 0.54 for 10% polystyrene in pyridine (from -64° to 48°), and 0.54 for polymethyl methacrylate in acetone (from -68° to 48°). The value of n is smaller, the greater the temp. coeff. of η_0 of the solvent. The temp. coeff. of intrinsic viscosity calcd. for a const. vol. concn. is for these systems 0.0008, -0.0028, -0.0010, -0.0002, 0.0008, and -0.0012, resp. Except for polyisobutylene the polymer length decreases when temp. rises.

J. J. Bikerman

AS 6-51A METALLURGICAL LITERATURE CLASSIFICATION

MATERIALS INDEX										AUTHOR INDEX															
1ST AND 2ND CROSS										1ST AND 2ND CROSS															
A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z

SHISHKIN, N. I., Kobeko, P. P., Marey, F.I. (Deceased), and N. S. Ivanova

"Plastic Deformation and Viscosity of Ice," Zhurnal Tekhnicheskoy Fiziki,
Vol. XVI, No. 3, 1946

Physico-Technical Inst., Acad. Sci. USSR, Leningrad.

Full Trans - W 583, 15 Jun 1948

1ST AND 2ND COVERS		3RD AND 4TH COVERS	
COMMON ELEMENTS			
<p><i>12</i></p> <p>The amorphous state, dependence of the electrical conductivity of undercooled liquids on pressure, volume, and temperature. P. P. Kobrko and N. I. Nishkin (Leningrad Phys.-Tech. Inst.), <i>J. Tech. Phys. (U.S.S.R.)</i> 17, 27-30(1947)(in Russian). —In a cylindrical bomb 13 cm. in diam., 16 cm. long, wall thickness 5.4 cm., permitting pressures p up to 6000 atm., equipped with a cylindrical inner electrode and protective ring to permit resistivity measurements up to 10^{14} ohm. cm., depts. were made on a fused 1:1 (by wt.) mixt. of phenolphthalein and salol. Under 3350 atm., the dielec. const. ϵ (measured in d.c.) remains const. in the temp. range from 280 to about 330°K. from where it begins to increase with further rising temp.; the transition corresponds to that from the vitreous to the liquid state and the effect of increased p is a shift of that point to higher temp., by about 50°. The increase of $\log \rho$ (sp. elec. resistivity) with increasing p at const. temp. is linear, the slope $k = \partial \log \rho / \partial p$ being greater the lower the temp.: $k = 1.4 \times 10^{-2}$ and 2.8×10^{-2} at 04.1 and 00°, resp. Glycerol shows the same linear dependence of $\log \rho$ on p, and about the same variation of k between -20.4° and -53.0°. The k values of the highly viscous liquids are several times as high as those generally indicated by Bridgman for more fluid liquids. In terms of the vol. v, $\log \rho$ increases with decreasing v at about the same rate as with increasing p. A given variation of v, if brought about by changing the temp., affects ρ much more strongly than the same varia-</p>		<p>tion caused by a change of p. e.g., a 2.5% decrease in v by pressure, at const. temp., causes only an 8-10 fold increase in ρ, as against a 5×10^2 fold increase corresponding to the same change in v achieved by a 0.05° lowering of temp. Const.-p curves of $\log \rho$ against $1/T$ are shifted nearly parallel to each other to higher $1/T$ with increasing p: from 1 to 404 and from 1 to 1340 atm., the shifts in $10^3/T$ are 0.12 and 0.25; at all three p, the slopes $\partial \log \rho / \partial(1/T)$ increase continuously with falling temp. Const.-v curves of $\log \rho$ against $1/T$ are of the same nature as the const.-p but have a lesser slope and intersect the latter when plotted on the same $1/T$ scale. Between two not too distant temps. T_1 and T_2, the coeff. k (at const. T) and $B = \partial \log \rho / \partial(1/T)$ (at const. p) are related by $k/B = (1/\rho)[(1/T_1) - (1/T_2)] = (1/\rho) \Delta(1/T)$ or, $\Delta(1/T)$ being the same for a given p, $k/B = \text{const.}$, i.e. k and B vary in the same way. This fact, and the contrast in the effects on ρ of p and of temp., are evidence of the deep difference between the structural changes brought about by compression and by thermal contraction and a challenge to current theories linking properties of liquids essentially with changes of density.</p> <p>N. Thon</p>	
A 30-31A METALLURGICAL LITERATURE CLASSIFICATION			
MATERIALS		REPORTS	
13000 27000 30000 31000		32000 33000 34000 35000	
13000 27000 30000 31000		32000 33000 34000 35000	

Shishkin, N.I.

CH ✓ Conductivity of solids and of liquids. P. P. Kobeko and N. I. Shishkin. *Pamyat' Stroya Inzhenera* Vostochnykh Kraev S.S.R. 1952, 313-18. — The modern theories of the cond. of solids are based on the exptl. fact of an exponential relation between cond. and abs. temp. of the type $\gamma = Ae^{-E/T}$. However, the exptl. and the theoretical values of A do not coincide. It is proposed to solve this problem by a study of the cond. of liquids. The calcns. are based on the assumption that viscous flow and cond. are analogous. The correspondence of the curves $\log \eta = f(1/T)$ and $\log \rho = f(1/T)$ of liquids for $1/T = 0$ make it possible to check the theory experimentally and to det. the exactness of the theoretical values of A (which cannot be done for solids). Since A has the same meaning for solids and for liquids, the result obtained for liquids can be applied to solids and thus it becomes possible to calc. A for any temp. for liquids, crystals, and glasses. N. G.

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A
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SHISHKIN, N. I.

USSR .

Intermolecular bonds in liquids. Dependence of infrared absorption spectra of the H bond on temperature and pressure. N. I. Shishkin and I. I. Novak. *Zhur. Tekh. Fiz.* 23, 1488-1491 (1957). Absorption spectra were studied in the 1.3-1.7- μ region of pure PrOH, hexyl alc., heptyl alc., and nonyl alc. and of phenol, of their solns. in CCl_4 , and of phenolformaldehyde tar at pressures up to 3200 kg./sq. cm. and temps. 18-93°. The degree of assocn. can be detd. from the intensity of band 1.65 μ corresponding to OH groups assocd. by a H bond, and band 1.41 μ corresponding to "free" CH groups. A Hilger double spectrophotometer with a PbS cell was used for the expts. The sample was placed under hydraulic pressure in CCl_4 ; however, since CCl_4 crystallizes at room temp. at 1000 kg./sq. cm., a mixt. of 50% CS_2 and 50% CCl_4 was used at higher pressures. The change of the optical density is $\Delta D = D/\alpha \Delta T$ and $\Delta D = D\beta \Delta p$, where α is the thermal expansion and β the compressibility coeff.; $D = k_0 l c$, where k_0 is the absorption per bond, l the vol. concn. of bonds, and c the thickness of the sample. For the temps. 20-70° and pressures 1-2000 kg./sq. cm. k_0 is const. The values of $k_0 \times 10^{-4}$ are 2.75, 2.95, 2.8 and 3.0 sq. cm./mol., resp., for PrOH, hexyl alc., heptyl alc., and phenol. The concn.-dependent const., k_0 , varies with temp. and pressure; this indicates a change in the no. of H bridges. Increased pressure has the same effect as decreased temp. decreasing the no. of free OH groups. A change in temp. of 1° corresponds to 60-130 kg./sq. cm. change. The slope of $(\Delta p/\Delta T)k_0$ is the same as that of $(\Delta p/\Delta T)$, where T_c is the crystn. temp.; this indicates that crystn. occurs at equal conditions of mol. interaction.

S. Pakswen
MCT

SHISHKIN, N. I.

"Kinetic Properties of Liquids and Gases." Dr Phys-Math Sci, Leningrad
Physicotechnical Inst, Acad Sci USSR, Leningrad, 1954. (XL, No 1, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher
Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

SHISHKIN, Nikolay Ivanovich

SHISHKIN, Nikolay Ivanovich - Academic degree of Doctor of Physico-Mathematical Sciences based on his defense, 21 February 1955, in the Council of the Leningrad Physical and Technical Inst Acad Sci USSR, of his dissertation entitled: "Kinetic properties of fluids and glass." for the Academic Degree of Doctor of Sciences

SO: Byulleten' Ministerstva Vysshego Obrazovaniya SSSR, List No. 3, 4 February 1956
Decisions of the Higher Certification Commission Concerning Academic Degrees
and Titles.

SPAS/NY 54

USSR/Physics - Vitrification

FD-3034

Card 1/2 Pub. 153 - 3/23

Author : Shishkin, N. I.

Title : Vitrification of liquids under pressure. I: Dependence of volume upon temperature and pressure

Periodical : Zhur. eksp. i teor. fiz., 25, February 1955, 188-195

Abstract : The author presents experimental data on the dependence of the volume of supercooled liquids upon temperature and pressure. From the character of the curves $v=f(p)$ corresponding to various temperatures he determines the external pressures for which the liquid vitrifies. He shows that vitrification of a liquid sets in for higher temperatures than for higher pressures. The volume of the liquid under the conditions of vitrification become smaller the higher p and T . The author concludes that density increases during vitrification that are proportional to pressure are observable at even lower pressures, and compression of the atoms or molecules in this case does not possess essential significance, the main cause for the density increase being the decrease in the free space between the molecules, i.e. decrease in free volume; the result of the measurements consequently indicate that the free volume of the

FD-3034

Card 2/2

substance situated under conditions for vitrification is less the higher the temperature and pressure and therefore is not an essential factor determining the condition for vitrification. Four references: e.g. Bridgman etc.

Institution : --

Submitted : April 15, 1954

FD-3035

USSR/Physics - Vitrification

Card 12 Pub. 153 - 4/23

Author : Shishkin, N. I.

Title : Vitrification of liquids under pressure. II: Dependence of dielectric permeability and relaxation time upon temperature and pressure

Periodical : Zhur. tekhn. fiz., 25, February 1955, 196-203

Abstract : In part I the author presented data on the dependence of the volume of supercooled liquids upon temperature and pressure and concluded that the temperature of vitrification of liquids is enhanced with increase of external hydrostatic pressure, the free volume during vitrification becoming less the higher the temperature and pressure. In the present part the author presents data on the dependence of dipole polarization upon temperature and pressure and thus obtains more accurate determination of the transition of a liquid to the vitrified state, this data moreover allowing him to determine the time of dielectric relaxation of the liquid. According to the author's opinion, there is no data in the literature on the dependence of the relaxation time of liquids upon pressure, such data being necessary for an understanding of the state of a

Card 2/2

FD-3035

liquid which is being vitrified at high external pressures. The author thanks M. V. El'konina and L. I. Rozgacheva, who participated in the measurements. He cites his earlier works: *ibid.*, 10, 1940 (co-authors: P. P. Kobeko and Ye. V. Kuvshinskiy) and 8, 1938 (co-author: same).

Institution : --

Submitted : June 4, 1954

USSR/Physics - Vitrification

FD-3036

Card 1/1 Pub. 153 - 5/23

Author : Shishkin, N. I.

Title : Vitrification of liquids under pressure. III: Dependence of electrical conductivity upon temperature and pressure

Periodical : Zhur. tekhn. fiz., 25, February 1955, 204-216

Abstract : In parts I and II the author presented data on the dependence of volume and relaxation time of supercooled liquids upon temperature and pressure, and showed that the temperature T_c of vitrification of liquids is enhanced for increase of external hydrostatic pressure and that the free volume for vitrification becomes less the higher the temperature and pressure, the relaxation time of the liquid during vitrification becoming constant. In the present work, part III, the author determines the state of vitrification of a liquid under pressure from the character of the dependence of specific resistance ρ upon temperature and pressure, and discusses both the character of the dependence of ρ on T and ρ on p for liquids and glasses and also the phenomenon of vitrification. He thanks Professor Ye. V. Kuvshinskiy and Yu. N. Obratsov for discussion of the manuscript and M. V. El'konina. 11 ref.

Submitted : June 5, 1953

SCHISCHKIN, N.I.

CARD 1 / 2

PA - 1207

SUBJECT USSR / PHYSICS
 AUTHOR SCHISCHKIN, N.I.
 TITLE The Dependence of the Kinetic Characteristics of Liquids and Glasses on Temperature, Pressure, and Volume.
 PERIODICAL Zhurn. techn. fis, 26, 1461-1482 (1956)
 Publ. 7 / 1956 reviewed 8 / 1956

Modern theories know no strict distinction between the mechanism of motion of molecules in liquids and such a mechanism in solids. The dependence of kinetic characteristics on temperature is in both cases expressed by the same formulae. The amounts of activation energies are not ascertained by these theories, but the latter offer the possibility of a modification of activation energies on the occasion of a modification of exterior conditions. In the present work hypotheses concerning the character and the extent of the modification of activation energy is investigated in dependence on temperature, but also in dependence on exterior conditions. It is shown that the activation energies computed according to the formula are lower for glass than for liquids. This discrepancy was caused by neglecting intermolecular interaction which develops in a different manner in glass and in liquids. Whereas in the case of glass these modifications are only slight and not accompanied by a reshuffle of molecules, they are considerable in the case of liquids, and are accompanied by a reshuffle. The lower the temperature of the liquid, the higher is the degree of intermolecular interaction; the

Žurn. techn. fis, 26, 1461-1482 (1956)

CARD 2 / 2

FA - 1207

higher the time constant of relaxation, the greater the activation energy. It is shown that the activation energy of kinetic processes and the equilibrium constants of reaction are modified in accordance with temperature, which shows that with a reduction of the temperature of the liquid the energetic thresholds are increased as a result of the formation of new intermolecular relations. Next, Eiring's theory is investigated with respect to highly viscous and only slightly viscous liquids; it was found that contradictions occur, which is indicative of the formal character of the formulae for the entropy ΔS^* and the volume Δv^* . The theory of Frenkel is subjected to a close scrutiny with the result that the activation energy for diffusion at a constant temperature of the liquid was found to increase with a linear law, i.e. with the increase of the molecular volume of the diffusing molecule. Such a governing law is equivalent to the linear dependence of the activation energy upon volume. In conclusion, the dependence of kinetic properties on exterior conditions in liquids and glass was stated to be only a special case.

INSTITUTION: Physical-Technical Institute of the Academy of Science in the USSR, Leningrad.

SHISHKIN, H. I., Professor

"Electric Conductivity of Solidified Glasses"

Report presented at a Conference on Solid Dielectrics and Semiconductors,
Tomsk Polytechnical Inst., 3-8 Feb. 58.
(Elektrichestvo, '58, No. 7, 83-86)

SHISHKIN, N. I., TSEKHANSKIY, M. I., KHUDCYAROV, K. V., and SUSLOPAROV, G. D.

"Use of Ca⁴⁵."

report presented at The Use of Radioactive Isotopes in Analytical
Chemistry, Conference in Moscow, 2-4 Dec 1957
Vestnik Ak Nauk SSSR, 1958, No. 2, (author Rodin, S. S.)

SHISHKIN, N.I.; VERSHININA, M.P.

Temperature dependence of the electric conductivity of polymers.
Fiz.tver.tela 1 no.5:798-802 My '59. (MIRA 12:4)

1. Fiziko-tehnicheskii institut AN SSSR, Leningrad.
(Polymers--Electric properties)

SHISHKIN, H.I.

Vitrification of liquids and polymers under pressure. Part 5.
Production of condensed glass. Fiz. tver. tela 2 no.2:350-357
F '60. (MIRA 14:8)

1. Fiziko-tekhnicheskii institut AN SSSR, Leningrad.
(Glass manufacture--Chemistry)

SHISHKIN, N.I.; KOVALICHEV, O.F. .

Vitrification of liquids and polymers under pressure. Part 6:
Temperature dependence of the volume of condensed glass.
Fiz. tver. tela 2 no.2:358-360 F '60. (MIRA 14:8)

1. Fiziko-tekhnicheskiy institut AN SSSR, Leningrad.
(Glass manufacture--Chemistry)

S/181/62/004/010/006/063
B108/B186

AUTHORS: Shishkin, N. I., and Milagin, M. F.

TITLE: Birefringence and the stretching of polymethyl methacrylate

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2681-2688

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SUBA

Card

TEXT: To study the orientation processes in polymethyl methacrylate (PMMA) the authors made stretching tests for establishing a relationship between the elongation L and the birefringence Δn . The latter can then be regarded a positive measure of orientation since it increases as the anisotropy of the polarizability of the molecules increases. Samples were heated to 100 - 200°C in a thermostat, and were then stretched and cooled to room temperature under a load. After removal of the load the birefringence was measured at 20°C in dependence on the degree of stretching. The theoretical formula $\Delta n = B(L^2 - 1/L)$ (L. R. G. Treloar. Trans. Far. Soc., 43, 277, 1947) is satisfied only for elongations λ up to 25%, where $\bar{\lambda} = (L - 1) \cdot 100$; B is a constant accounting for the anisotropy of the polarizability and for the length of the molecular chains. L is

S/181/62/004/012/032/052
B125/B102

AUTHORS: Milagin, M. F., and Shishkin, N. I.

TITLE: Breaking strength and birefringence of caprone and polypropylene fibers

PERIODICAL: Fizika tverdogo tela, v. 4, no. 12, 1962, 3578-3580

TEXT: Data on the correlation between breaking strength and birefringence of caprone and polypropylene fibers are reported. The caprone fiber samples were produced at room temperature by "cold" drawing of the non-oriented fiber (diameter 0.04-0.07 mm). Not all of the fibers had a circular cross section. Various values for the double refraction (Δn) were obtained by stretching the fibers to various extents (from 0 to 350%). A polarizing microscope of the type МИН-8 (MIN-8) with a Babinet-Soleil compensator was used for measuring Δn at 20°C in the center of the samples. One end of the sample was clamped, whereas the other was loaded at +20° and -195°C, the load being increased until the sample fractured. The breaking strength (result averaged from 10 to 30 measurements) of caprone and polypropylene increases with increasing birefringence, at
Card 1/3

S/181/62/004/012/032/052
B125/B102

Breaking strength and ...

first weakly and then more and more strongly. At -195°C the breaking strength is much higher than at +20°C. The dependence of the breaking strength σ on the birefringence, as here detected, satisfies the empirical relation $\sigma = \sigma_0 e^{\alpha \Delta n}$. σ_0 , the strength of the isotropic nonoriented fiber and α are empirical constants involved.

	σ_0 kg/mm ²	α
caprone -195°C	20	44
polypropylene +20°C	14	50
-195°C	27	50

According to the theory (see e.g. C. C. Hsiao. J. Appl. Phys., 30, 10, 1492, 1959), the higher strength of the oriented fiber (in caprone at least ten-fold) is attributed to the effect of the lateral chains of the molecule, to partial crystallization in the fiber substance and to other facts determined theoretically. There are 2 figures and 1 table.

Card 2/3

Breaking strength and ...

S/181/62/004/012/032/052
B125/B102

ASSOCIATION: Fiziko-tehnicheskii institut im. A. F. Ioffe AN SSSR,
Leningrad (Physicotechnical Institute imeni A. F. Ioffe
AN SSSR, Leningrad)

SUBMITTED: July 11, 1962

Card 3/3

S/181/62/004/010/007/063
B108/B186

AUTHORS: Milagin, M. F., and Shishkin, N. I.

TITLE: Breaking strength and birefringence of stretched (oriented) polymethyl methacrylate

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2689-2691

TEXT: It was found earlier (FTT, v. 4, no. 10, 1962, 2681-2688) that the degree of orientation of polymethyl methacrylate (PMMA) is no explicit function of the degree of stretching. Since birefringence can be used as an unambiguous measure of the orientation of the molecules in PMMA it is used to establish a relationship between the orientation and the breaking strength of PMMA. Stretched samples were examined at 20°C, samples without any stretching at -195°C. A definite relationship between the breaking strength σ and the orientation or the birefringence Δn of oriented samples was found: $\sigma = \sigma_0(1 + \alpha \Delta n)$, where σ_0 is the strength of the unoriented sample, α is a constant coefficient equal to $-1.3 \cdot 10^3$ in the authors' experiments. There is no relationship between the strength and the degree

Card 1/2

Breaking strength and birefringence ...

S/181/62/004/010/007/063
B108/B186

of stretching. There are 4 figures.

ASSOCIATION: Fiziko-tehnicheskiy institut im. A. F. Ioffe AN SSSR,
Leningrad (Physicotechnical Institute imeni A. F. Ioffe
AS USSR, Leningrad)

SUBMITTED: April 21, 1962

Card 2/2

ACCESSION NR: AP4004850

S/0181/63/005/012/3453/3462

AUTHORS: Shishkin, N. I.; Milagin, M. F.; Gabarayeva, A. D.

TITLE: Molecular network and orientation processes in amorphous polystyrene

SOURCE: Fizika tverdogo tela, v. 5, no. 12, 1963, 3453-3462

TOPIC TAGS: polystyrene, amorphous polystyrene, polymer, linear polymer, molecular network, elasticity, birefringence

ABSTRACT: The authors' purpose has been to study the processes of orientation and stretching in linear polymers. The study was made on atactic unfractionated polystyrene. Data were obtained on double refraction and elasticity for average molecular weights of $9 \cdot 10^4$, $2 \cdot 10^5$, and $7 \cdot 10^5$. It was shown that in the temperature interval 110-180C, with specimens being stretched for periods ranging from 2 to 1800 seconds in the region of linear strain dependence, highly elastic deformation of the polymer took place, with no indications of irreversible deformation. It was shown that Brewster's law held under these conditions. The experimental data were considered in light of the kinetic theory of photoelastic properties of rubber. It was concluded that the number of stress nodes in the molecular network

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ACCESSION NR: AP4004850

per unit volume of amorphous oriented polymer diminished markedly with rise in temperature and passage of time (during interval of stretching) and with decrease in average molecular weight of the polymer. It was further concluded that, by varying the conditions of stretching, unfractionated polymer samples and fibers may be obtained that are oriented at the expense of all the molecules or of only the large molecules in the polymer. Orig. art. has: 9 figures, 2 tables, and 7 formulas.

ASSOCIATION: Fiziko-tekhnicheskiiy institut im. A. F. Ioffe AN SSSR, Leningrad
(Physical and Technical Institute AN SSSR)

SUBMITTED: 25Jun63

DATE ACQ: 03Jan64

ENCL: 00

SUB CODE: PH

NO REF SOV: 006

OTHER: 006

Card 2/2

S/0181/64/006/005/1413/1417

ACCESSION NR: AP4034921

AUTHORS: Milagin, M. F.; Shishkin, N. I.; Gabarayeva, A. D.

TITLE: The change in double refraction during annealing of oriented polystyrene

SOURCE: Fizika tverdogo tela, v. 6, no. 5, 1964, 1413-1417

TOPIC TAGS: double refraction, polystyrene, annealing, hyperelastic deformation, disorientation

ABSTRACT: The temperature and time dependence of double refraction and hyperelastic deformation during annealing of oriented samples of polystyrene were studied. It was found that the double refraction of oriented samples depends both on the annealing temperature and on the duration of the annealing process. When samples with unattached ends are annealed (for any fixed period of annealing) the dependence of the relative degree of orientation on temperature is the same for all samples oriented under different conditions. As a result, complete disorientation of samples reaches completion at approximately the same temperature. When annealing samples with definite lengths, the dependence of orientation on temperature for any definite annealing period is different for samples oriented under different conditions. The same is true for dependence of orientation on duration of annealing

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ACCESSION NR: AP4034921

at some constant temperature. The temperature and duration of annealing for complete disorientation are greater the higher the molecular weight of the chain and the molecular weight of the polymer. In annealing, as well as in pulling, samples of a linear amorphous polymer may have simultaneously greater hyperelastic deformation and practically no double refraction. Orig. art. has: 5 figures and 2 tables.

ASSOCIATION: Fiziko-tekhnicheskiy institut im. A. F. Ioffe AN SSSR, Leningrad
(Physicotechnical Institute AN SSSR)

SUBMITTED: 20Nov63

ENCL: 00

SUB CODE: MT, OP

NO REF SOV: 002

OTHER: 001

2/2

Card

Исследователи: ШИШКИН, Н.С.; ГАВВАКИНА, А.А.

Изменение дубинизации ориентированного полистирола после отжига.
Изв. высш. шк. № 3:1413-1417 1961. (ХИМ 17:9)

1. Физико-технический институт имени Ломоносова АН СССР, Ленинград.

L 18246-65 EWT(m)/EPF(c)/EWP(j)/T Pc-l/Pr-l RM

ACCESSION NR: AP5000663

S/0181/64/006/012/3636/3639

AUTHORS: Milagin, M.F.; Gabarayeva, A.D.; Shishkin, N.I.

TITLE: Rupture strength and double refraction of polystyrene

SOURCE: Fizika tverdogo tela, v. 6, no. 12, 1964, 3636-3639

TOPIC TAGS: polystyrene, polymer chain, polymer rheology, rupture strength

ABSTRACT: This is a continuation of earlier work (FTT v. 4, 2681, 1962 and v. 5, 3453, 1963) on solid oriented polymers whose properties depend on such parameters as the number of chains or knots of the molecular grid and also the molecular weight of the chain. It was shown earlier (FTT v. 6, 1413, 1964 and v. 6, 1413, 1964) that the rate of relaxation of the oriented polymer during the course of its annealing and drawing is connected with these parameters. In the present article the effect of these

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L 18216-65

ACCESSION NR: AP5000663

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parameters on the rupture strength of a solid oriented polymer is investigated. Oriented samples of polystyrene were produced by drawing samples of amorphous polystyrene at a fixed temperature and for a fixed time, and rapidly cooling to room temperature under load. The double refraction was measured at 20C. The drawing conditions were varied in such a way that the molecular weight of the chains in the sample ranged from 6×10^3 to 2×10^5 . The rupture strength of the samples was measured at 20 and -195C at an approximate rate of 100%/min. The results have shown that the drawing conditions are determined by a function whose parameters are the temperature of the polymer and the time during which the drawing takes place. If the drawing conditions of the polystyrene sample are identical, the molecular weight of the chain remains the same. The variation of the rupture strength with the double refraction is shown in Fig. 1 of the enclosure. An analysis of the results shows that the knots of the grid are defects which reduce the strength of

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L 18246-65

ACCESSION NR: AP5000663

the solid oriented polymer. It is also found that the strength of solid samples having a degree of drawing 0--1,000% (obtained without plastic deformation) and almost zero double refraction is equal to the strength of the unoriented non-annealed polymer. Orig. art. has 3 figures, and 1 formula.

ASSOCIATION: Fiziko-tehnicheskii institut im. A. F. Ioffe
AN SSSR Leningrad (Physicotechnical Institute AN SSSR)

SUBMITTED: 20May64

ENCL: 01

SUB CODE: SS, OC

NR REF SOV: 006

OTHER: 001

Card 3/4

L 18246-65

ACCESSION NR: AP5000663

ENCLOSURE: 01

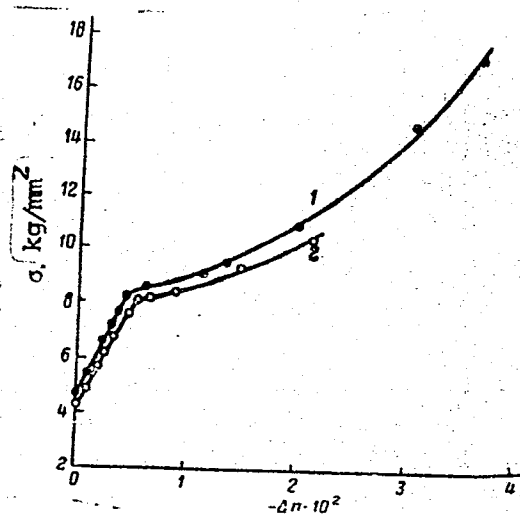


Fig. 1. Dependence of the strength on the double refraction for polystyrene.

Molecular weight (M): 1 - 7×10^5 ;
2 - 2×10^5 .

Card 4/4

L 00805-67 EWT(m)/EWP(j)/T RM

ACC NR: AP6023391

SOURCE CODE: UR/0374/66/000/003/0323/0329

AUTHOR: Shishkin, N. I.; Milagin, M. F.

33
32

ORG: Physicotechnical Institute im. A. F. Ioffe, Academy of Sciences SSSR,
Leningrad (Fiziko-tehnicheskij Institut, AN SSSR)

B

TITLE: Relaxation processes in polarized amorphous polymers

SOURCE: Mekhanika polimerov, no. 3, 1966, 323-329

TOPIC TAGS: polystyrene, stress analysis, stress relaxation, elasticity, temperature test

ABSTRACT: The rates of relaxation processes in amorphous polystyrene are examined. Three conditions are considered, i. e., 1) with the sample under constant stress, the elastic deformation increases with time, 2) if a prestressed sample's length is fixed, the stress drops with time, and finally, 3) if such a sample is released from the clamps maintaining it's length, the elongation produced is minimized to zero with time. The concept of lattice structure in linear polymers is used in the

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UDC: 678:539.32

ACC NR: AP6023391

interpretation of experimental results. The kinetic theory of rubber elasticity is applied to formulate the relationship between the stress and deformation, and to express the dependence of elasticity and birefringence on the temperature and time. Conclusions on the molecular mechanism and the rates of relaxation process in amorphous polymers under application of stress and heat are given. The author thanks A. I. Gubanov for his personal participation in the evaluation of experimental results. Orig. art. has: 1 figure and 9 formulas.

APPROVED FOR RELEASE: 08/23/2000

CIA-RDP86-00513R001549610004-1

[KP]

SUB CODE: 11/ SUBM DATE: 10Nov65/ ORIG REF: 003/ OTH REF: 003

Card 2/3 vlr

ALAMPIYEV, P.M.; ZHIRMUNSKIY, M.M.; KLUPT, V.S.; KONSTANTINOV, O.A.;
MILEYKOVSKIY, A.G.; SEMEVSKIY, B.N.; FEYGIN, Ya.G.; SHISHKIN,
N.I.; YANITSKIY, N.F.

Letter to the editors of the journal "Izvestia AN SSSR, Seria
Geograficheskaya." Izv. AN SSSR. Ser. geog. no. 6:146-147 N-D '62.
(MIRA 15:12)

(Geography, Economic)

FEYGIN, Ya.G., doktor ekon. nauk; YANITSKIY, N.F., doktor geogr. nauk; ZHIRMUNSKIY, M.M., doktor geogr. nauk; ALAMPIYEV, M.P., doktor ekon. nauk; KOSTENNIKOV, V.M., kand.ekon. nauk; BUYANOVSKIY, M.S., kand. geogr. nauk; SHISHKIN, N.I., doktor geogr. nauk; MOSKVIN, D.D., kand.ekon. nauk; GURARI, Ye.L., kand.ekon.nauk; VETROV, A.S., kand.geogr. nauk; LISETSKAYA, A.P., red.; PONOMAREVA, A.A., tekhn. red.

[Methodological problems of economic geography] Metodologicheskie voprosy ekonomicheskoi geografii. Moskva, Ekonomizdat, 1962. 278 p. (MIRA 15:7)

1. Chlen-korrespondent Akademii nauk USSR i Institut ekonomiki Akademii nauk SSSR (for Feygin).
 2. Institut geografii Akademii nauk SSSR (for Yanitskiy, Zhirmunskiy, Buyanovskiy).
 3. Institut ekonomiki mirovoy sotsialisticheskoy sistemy Akademii nauk SSSR (for Alampiyev).
 4. Gosudarstvennyy nauchno-ekonomicheskij sovet Soveta Ministrov SSSR (for Kostennikov).
 5. Nauchno-issledovatel'skiy institut truda Gosudarstvennogo komiteta Soveta Ministrov SSSR (for Shishkin).
 6. Institut ekonomiki Akademii nauk SSSR (for Moskvina).
 7. Orenburgskiy pedagogicheskij institut (for Vetrov).
- (Geography, Economic--Methodology)

SHISHKIN, N.I.

Redirecting the Vychegda and Pechora River runoffs into the Volga Basin. Izv. AN SSSR. Ser. geog. no.5:86-94 S-O '61. (MIRA 14:9)

1. Nauchno-issledovatel'skiy institut truda Goskomiteta Soveta Ministrov SSSR po voprosam truda i zarabotnoy platy.

(Vychegda River--Regulation) (Pechora River--Regulation)
(Volga River)

SHISHKIN, Nikolay Ivanovich; MARGOLIN, Ya.A., red.; KONOVALYUK, I.K.,
mladshiy red.; GOLITSYN, A.V., red.kart; KOSHELEVA, S.M., tekhn.red.

[The Komi A.S.S.R.; economic-geographical features] Komi ASSR;
ekonomiko-geograficheskaya kharakteristika. Moskva, Gos.izd-vo
geogr.lit-ry, 1959. 222 p. (MIRA 12:12)
(Komi A.S.S.R.--Economic conditions)

SHISHKIN, N.N., red.

[Instructions 246-54 for checking standard chronometers] Instruktsiia 246-54 po poverke obraztsovykh khronometrov. Izd. ofitsial'noe. Moskva, 1957. 36 p. (MIRA 14:5)

1. Russia(1923- U.S.S.R.) Komitet standartov, mer i izmeritel'nykh priborov.

(Chronometer--Testing)

С И М П Л О М А Т И К И

BEREGOVSKIY, V.Ye.; VASILENKO, M.I.; VELIER, R.L.; VERBLOVSKIY, A.M.;
VERNER, B.F.; VOYDALOVSKAYA, Ye.N.; VOL'SKIY, A.N.; GLAZKOVSKIY, A.A.;
GRANOVSKIY, B.L.; GREYVER, N.S.; GUDIMA, N.V.; DOLGOPOLOVA, V.I.;
KARCHEVSKIY, V.A.; KOVACHEVA, Ye.B.; KUDRYAVTSEV, P.S.; LEBEDEV, A.K.;
LISOVSKIY, D.I.; LIKHNITSKAYA, Z.P.; MATVEYEV, N.I.; MEL'NITSKIY, A.N.;
MIRONOV, A.A.; MIKHEYEVA, A.A.; MURACH, N.N.; OKUB', A.B.; OL'KHOV, N.P.;
OSIPOVA, T.B.; PAVLOV, V.P.; ROTINYAN, A.L.; SAZHIN, N.P.; SEVRYUKOV, N.N.;
SIDOROV, P.M.; SOBOL', S.I.; KHEYFETS, V.L.; TSEYNER, V.M.;
SHAKHNAZAROV, A.K.; SHEYN, Ya.P.; SHEREMET'YEV, S.D.; SHERMAN, B.P.;
SHISHKIN, N.N.; SHLOPOV, A.P.

Georgii Ivanovich Blinov. TSvet.met. 28 no.6:62 N-D '55.

(MIRA 10:11)

(Blinov, Georgii Ivanovich, 1911-1955)

SHISHKIN, N.N.

"Atlas of ore structure and textures." S.L.Taldykin, N.F.Goncharik,
G.N.Enikeeva, B.B.Rozina. Reviewed by N.N.Shishkin. Zap.Vses.min.
ob-va 85 no.1:122-124 '56. (MLRA 9:7)

L.Rusno-geologicheskaya laboratoriya instituta Gipronikel'.
(Ores--Classification)(Taldykin, S.I.)(Goncharik, N.F.)(Enikeeva, G.N.)
(Rozina, B.B.)

20-2-50/60

AUTHOR: Shishkin, N. N.

TITLE: Some Data on a Highly Nickeliferous Variety of Cobaltite
(O nikelistoy raznovidnosti kobal'tina)

PERIODICAL: Doklady Akademii Nauk SSSR, 1957, Vol. 114, Nr 2, pp.414-415
(USSR)

ABSTRACT: As it is known, cobaltite contains 20 - 34 % cobalt, 2-3 % nickel, and 1.6 - 10 % less frequently up to 16 % iron. In this latter case, one speaks of the strongly ferriferous species of cobaltite, namely ferro-cobaltite, but this distinction is sometimes questioned, because analytical investigations have failed to confirm the high percentage of iron. During his research work on cobaltite from the Altai Mountains, the author of the paper under review has found a highly nickeliferous variety of cobaltite, with reduced contents of cobalt and with differing optical properties. Some time ago, a similar discovery was made in the Ural Mountains. Vladimirovskoye the deposit where the highly nickeliferous variety of cobaltite was found in the Altai Mountains, is situated in the "skarns"

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20-2-50/60

Some Data on a Highly Nickeliferous Variety of Cobaltite

of the "exocontact of the diorite intrusion" and an effusive-sedimentary mass of the mid-Devonian. The form of the crystals is octahedral, pentagonal dodecahedral, and combination of cube and octahedron. The highly nickeliferous variety of cobaltite has a somewhat brighter pink color than normal cobaltite, with a violet shade in reflected light. The present paper lists additional properties of the mineral variety under consideration. On basis of the above, together with other data published so far, it can be stated that there exists a nickeliferous variety of cobaltite. Because the existence of such a variety confirms the wide boundaries of isomorphism between cobalt, nickel, and iron, this discovery is of great scientific interest, and it also may be of interest from the point of view of its use in practical work. There are 1 table, and 5 references, 4 of which are Soviet.

PRESENTED: November 15, 1956, by A. G. Betekhtin, Member of the Academy
SUBMITTED: November 15, 1956
AVAILABLE: Library of Congress

Card 2/2

AUTHOR: Shishkin, N.N. SOV-11-58-9-11/14

TITLE: A Few Comments on the Article by D.O. Ontoyev, "On Conditions of Localization of Nickel-Cobalt-Arsenide Ores in the Carbonate Veins Between the Skarns" (Neskol'ko zamechaniy po povodu stat'i D.O. Ontoyeva "Ob usloviyakh lokalizatsii nikel'-kopal'tovykh arsenidnykh rud v karbonatnykh zhilakh sredi skarnov")

PERIODICAL: Izvestiya Akademii nauk SSSR, Seriya geologicheskaya, 1958, Nr 9, p 100 (USSR)

ABSTRACT: The above-mentioned article by D.O. Ontoyev was published in Nr 9 (1957) of this periodical. These ores were discovered by V.A. Unksov, G.N. Ivanova, A.A. Bogomol and V.A. Bobrov in Khovakhsy of the Tuva Autonomous Oblast'. Since then these deposits were studied by V.I. Pondarenko, S.N. Kondakov, Ye.G. Starostina, R.S. Tarasova, N.A. Tikhomirova, Ye.I. Nefedov (VSEGEI), M.G. Markina, A.Ya. Vclzhenkova, A.P. Polushkina (VIMS), N.N. Shishkin, A.Ye. Aleshunina, V.A. Mikhaylova (Gipronikel'), G.A. Krutov, L.K. Yakhontova, A.A. Godovikov (MGU) and L.I. Gavrilova (Uralmekhanobr). The results of their research were published in a series of articles (Ref. 6).

Card 1/2

SOV-11-58-9-11/14

A Few Comments on the Article by D. O. Ontoyev, "On Conditions of Localization of Nickel-Cobalt-Arsenide Ores in the Carbonate Veins Between the Skarns"

D.O. Ontoyev did not take into consideration their findings and treated many facts incorrectly or even wrongly.
There are 6 Soviet references.

1. Nickel cobalt arsenide ores--USSR

Card 2/2

AUTHOR: Shishkin, N. N. SOV/20-121-4-41/54

TITLE: Julukulite - a New Cobalt Mineral (Dzhulukulit - novyy kopal'tovyy mineral)

PERIODICAL: Doklady Akademii nauk SSSR, 1958, Vol. 121, Nr 4, pp. 724 - 726 (USSR)

ABSTRACT: A.I.Igoshin handed over a collection of minerals from the Dzhulukul'skoye ore deposit to the author; in this collection the mentioned new mineral was contained. This deposit lies in the southwestern part of the Tuvinskaya Autonomous Area 10 km north-east of lake Dzhulu-Kul'. The rocks containing the deposits are metamorphosed porphyrites from the Cambrian-Ordovician (?). The mineralization is restricted to zones of hydrothermally changed rocks along short strata in a north-east and a north-west direction. Julukulite forms small disseminations and veinlets up to 2 mm and nests of 2-2,5 cm in size in short quartz ankerite veins. It occurs together with tennantite, glaucodote, pyrite and bornite. Its fine crystalline aggregates are grey and shine like metal. Hardness = 6, the crystals are octahedric, size = 0,008 to 0,3 mm in most cases 0,06. Also grains and aggregates of

Card 1/3

Julukulite - a New Cobalt Mineral

SOV/20-121-4-41/54

irregular shape occur. On polished sections the mineral is greyish white in incident light. In single crystals and druses sometimes a very weak anisotropy is observed: The color changes from light yellow to grey. Zones are visible in the crystals: In the case of etching with HNO_3 the greyish white zones are more rapidly etched and become black. The spectrum analysis showed minute admixtures of antimony, silver, bismuth, aluminium, magnesia, calcium, traces of lead, zinc and manganese. Table 2 reveals the results of the X-ray structural analysis. The size of the new elementary cell is close to that of cobaltine and gerstorffite. The nickel content of julukulite is higher than of nickel cobaltine. The new mineral may be regarded as a transitory product between cobaltine and gerstorffite. There are 2 tables and 7 references, 6 of which are Soviet.

ASSOCIATION: Proyeektnyy i nauchno-issledovatel'skiy institut "Gipronikel' ",
Leningrad (Leningrad, **Flanning** and Scientific Research Institute
"Gipronikel' ")
Card 2/3

SHISHKIN, N.N.

Gersdorffite from the Butrakhtinskoye deposit (Khakass Autonomous Province). Zap.Vses.min.ob-va 90 no.5:588-591 '61. (MIRA 14:10)

1. Institut "Gipronikel", Leningrad.
(Khakass Autonomous Province--Gersdorffite)

SHISHKIN, N.N.

Highly cobaltous variety of glaucodot. Zap. Vses. min. ob-va 91
no.1:102-103 '62. (MIRA 15:3)

1. Institut "Gipronikel", Leningrad.
(Glaucodot)

SHISHKIN, N.K.

Copper-nickel sulfide mineralization of basic and ultrabasic
rocks in the Yoko-Dovyrenskiy Massif. Geol. rud. mestorozn.
6 no.1:93-98 Ja-F '64. (MIRA 17:11)

1. Nauchno-issledovatel'skiy i proyektnyy institut "Gipronikel",
Leningrad.

SHISHKIN, N.N.

Genetic types of cobalt and cobalt-bearing ore deposits
and some characteristics of their mineralogical composition.
Sov.geol. 8 no.11:34-45 N '65.

(MIRA 19:1)

SHISHKIN, N.S.; DEMINA, M.Ye.; SHCHERBA, G.N.

Reviews and bibliography. Zap. Vses. min. ob-va 94 no.4:477-485 '65. (MIRA 18:9)

1. Nauchno-issledovatel'skiy i proyektnyy institut "Gipronikel", Leningrad (for Shishkin). 2. Leningradskoye otdeleniye Matematicheskogo instituta AN SSSR imeni Steklova (for Demina).

KORCHAGIN, A.I., master; MUSHINSKIY, A.R., master; SHISHKIN, N.P.,
master

Useful book ("TE3 diesel locomotive" by K.A.Shishkin and
others. Reviewed by A.I.Korchagin, A.R.Mushinskiy, N.P.,
Shishkin). Zhel.dor.transp. 41 no.11:92-93 N '59.
(MIRA 13:2)

1. Depo g.Orsk.
(Diesel locomotives) (Shishkin, K.A.)

SMISHEN, N.S. "FRANKEL", 1946

RT-1144 (The role of coagulation in the origin of lightning discharges. I) Rol'koaguliatsii vodiannykh kapel'v vozniknovenii grozovykh razriadov. I.
IZVESTIYA AKADEMII NAUK S.S.R. SERIYA GEOGRAFIKESKAYA I GEOFIZIKESKAYA, 10(4): 301-310,
1946. (Translation does not include bibliography.)

1. SMISHKIN, N. S.

2. USSR (600)

"Formation of Cells on Snow Surface."

Izvestiya vseseyusnogo geograficheskogo obshchestya, Issue 1, 1948 (90-91)

9. Meteorologiya i Gidrologiya, No. 3, 1949. Report U-2551. 30 Oct 52

THOMAS W. J.

"Growth of World Drug Use to the Disproportionate in 3, sets of '11", WORLD, No 7, 1948
(87-20)

cc: U-8139, 11 Mar 1973

SHISHKIN, N. S.

PA 41742

USSR/Geology
Soil Science
Arctic Studies

Mar/Apr 1948

"The Role of Convective Circulation in the Formation of the Cellular Forms of Microrrelief," N. S. Shishkin, Central Geophys Observatory, 5 pp

"Izv Akad Nauk SSSR, Ser Geograf i Geofiz" Vol XII, No 2

Argues against Loy's and Gripp's theory of convection, based on some cellular forms of microrrelief discovered in the arctic and the subarctic. Suggests that with the aid of the theory of convective circulation it is possible to explain the regular

41742

USSR/Geology (Contd)

Mar/Apr 1948

construction of all cellular forms of microrrelief, which appears in very moist soils. Among these forms are polygons, squares and hexagons. Submitted by Academician A. A. Grigor'yev, 29 Mar 1947.

41742

SHISHKIN, N. S.

PA only

USSR/Meteorological Research
Clouds

May/June 1948

"The Problem of the Development of Droplets in Clouds and Fogs," N. S. Shishkin, Main Geophys Obs, Leningrad, 5 pp

"Iz Ak Nauk SSSR, Ser Geograf i Geofiz" Vol XII, No 3.

Discusses question of the coagulation of droplets in clouds and fogs due to variation in the speed of fall. Theoretical method to calculate the growth of drops during their continuous distribution. Data obtained theoretically conforms favorably to data obtained from microphotographic analysis of drops. Submitted by Academician L. S. Leybenzon 29 Mar 1947.

66T95

SHISHKIN, N. S.

PA 53/49T94

USSR/Physics

Sep/Oct 48

Atmosphere

Convection

"The Interconnection Between Molecular, Turbulent, and Convective Heat Conductivity," N. S. Shishkin, Main Geophys Obs, Leningrad, 9 pp

"Iz Ak Nauk SSSR, Ser Geog i Geofiz" Vol XII, No 5

Considers mechanism of thermal convection in liquid or gaseous media and compares it with molecular and turbulent heat conductivity. Detailed study of the problem of vertical convection currents in the atmosphere. Substantiates gradual character of convection in the troposphere, and suggests a theory of the origin of cumuli. Submitted by Acad L. S. Leybenzon, 13 Jan 48.

53/49T94

SHISHKIN, H.S.

Calculating the intensity of precipitation from rain clouds. Trudy
GGO no.13:78-88 '48. (MLRA 10:1)

(Clouds) (Precipitation (Meteorology))

SHISHKIN, N. S.

FA 51T22

USSR/Geography

Jan/Feb 1948

"Formation of Honeycomb on the Surface of Snow," N. S. Shishkin, 1½ pp

"Izv Vsesoyuz Geograf Obsh" Vol LXXX, No 1

Briefly discusses cause of the interesting phenomenon of formation of honeycomb pattern on the surface of snow in mountain areas during summer. Such formation caused by unstable condition due to the difference in temperature under the surface of the snow and the air over the surface of the snow.

51T22

SHISHKIN, N. S.

PA 37/49T87

USSR/Geophysics
Rain
Meteorology

Feb 49

"Precipitations and Thunderstorms," N. S. Shishkin,
4 pp

"Priroda" No 2

Treats under: (1) clouds and their development,
(2) precipitations, and (3) mechanism of rain forma-
tion, thunder electricity. Includes two graphs.

37/49T87

3
2

Meteorological Abst.
Vol. 4 No. 5
May 1953
Miscellaneous
Applications

✓ 4.5-232 ✓ 551.594.25:551.574.1:551.515.41
Shishkin, N. S., O zariade kapel' v grozovykh oblakakh. [On the charge of drops in thunderclouds.] *U.S.S.R. Glavnoe Upravlenie Gidrometeorologicheskoi Sluzhby, Informatsionnyi Sbornik*, 1:47-54, 1951. 5 figs., 8 refs., 17 eqs. DLC—Calculation of the coagulation charge of drops in a polydisperse cloud with an ascending stream. The primary stage in drop growth is attributed to water vapor condensation. The development is very quick at the outset and slows down with increasing drop size. After reaching a size near 20μ the further growth is much affected by coagulation. The calculations made by the author show the most rapid growth of the drop charge in the layer 600-1200 m above the base of the cloud, when the speed of the ascending stream is 1 m/sec. Charges of the order of 10^{-1} CGSE are obtained at the height of 2.5-3.5 km over the cloud base (3.4-4.5 km above the ground surface). While falling from this height to 1 km above the cloud base, the charge of the sizable drops and the speed of growth increase rapidly and therefore the author considers this layer as the most probable area of the origin of thunderstorm electrical phenomena. The freezing of drops does not essentially change the results. A brief summary of measurements made from airplane by Ross GUNN. (*Physical Review*, 71:181, 1947) concludes the paper. *Subject Headings*: 1. Drop-charge 2. Thunderclouds 3. Drop growth 4. Thunderstorm electricity. I. Gunn, Mosk.—N. T. Z.

AND

AQUEOUS VAPOR AND HYDROMETEORS

3.5-234

551.574.1:551.576.11

Chishkin, N.S., O sliianii oblachnykh kapel'. (Coalescence of cloud droplets.) Leningrad, Glavnaya Geofizicheskaya Observatoriya, Trudy, No. 24, 26:27-38, 1951. 3 figs., 7 tables, 8 refs., 28 equations. BLS- After a brief, theoretical discussion of the growth of raindrops by condensation, the author presents a theoretical analysis of the mechanism of coalescence. The discussion covers the collision of droplets in the field of gravity, and the coalescence of droplets during sudden changes in the velocity of air flow and during periodic changes in the velocity of air flow. Subject Headings: 1. Droplet accretion 2. Cloud physics 3. Coalescence.- I.L.D.

PRECIPITATION

3.5-237

551.577.11:551.574.1:551.576.11

Chishkin, N.S., *Osadki iz konvektivnykh oblakov.* (Precipitation from convective clouds. Leningrad, Glavnaya Geofizicheskaya Observatoriya, *Trudy*, No. 24(86):37-47, 1951. 3 figs., 2 tables, 9 refs., 15 equations. DLC- A theoretical investigation of the growth of drops and a calculation of the intensity of precipitation from clouds in which the density of saturated vapor pressure and radius of the drops vary with height, approximately as under natural conditions. The author demonstrates a procedure for calculating the growth of drops & condensation in purely aqueous clouds and the number of raindrops and the intensity of rainfall and discusses the growth of particles in clouds containing water in the solid phase. Subject Headings: 1. Precipitation mechanism 2. Drop accretion 3. Convective clouds 4. Cloud physics.- I.L.D.

SHISHKIN N. S.

PS 194T83

USSR/Meteorology - Precipitations

Nov 51

"Investigations of Processes of Formation of
Summer Precipitations," N. S. Shishkin

"Uspekhi Fiz Nauk" Vol XLV, No 3, pp 313-356

Investigations of microstructure of clouds started
in USSR in 1935. In 1946 aircraft investigations
were performed by Ye. S. Selezneva, V. A. Zaitsev,
I. I. Chestnaya, A. M. Borovikov and others. Drop
distribution in clouds showed increasing size with
altitude. Describes radar search of storms in US.
Shishkin performs some computations of the forma-
tion of drops and precipitations.

194T83

SHISHKIN, N. S.

PA 237T51

USSR/Geophysics - Hail

Nov/Dec 52

"Investigating the Growth of Spherical Hail," N.S. Shishkin, Main Geophys Observatory imeni Voyeykov

"Iz Ak Nauk SSSR, Ser Geofiz" No 6, pp 73-78

Considers process of hail formation as a result of freezing of cloud drops in ascending cloud movements and concomitant decrease in temp. Describes dependence of characteristic elements of the phenomenon (velocity of hail growth, size of its particles, time of cloud's existence necessary for precipitation) on velocity of ascending currents.

237T51

SHISHKIN, N. S., CAND PHYS-MATH SCI

USSR/Meteorology - Summer Precipitation Jul 52

"Theory of Aestival Precipitations," N. S. Shishkin, Cand Phys-Math Sci, Leningrad Main Geophys Observations

"Meteorol i Gidrol" No 7, pp 17-22

Outlines theory of processes occurring in an ad cloud with an even, continuously rising flow.

States that although this theory is not yet complete. It nevertheless allows one to clarify the basic physical characteristics of processes of formation

230T82

of ppts. Briefly discusses role of appearance of hard spherical particles in the initial cloud. Finds investigations of arbitrarily shaped ice particles within the cloud are more complex, but the governing laws in this case do not differ essentially from the previous ones.

230T82

SHISHKIN, N. S.

PA 241T37

USSR/Geophysics - Hydrometeors

Jan/Feb 53

"Some Physical Laws Governing Phase Conversions of
Hydrometeors," N. S. Shishkin, Main Geophys Obs

"Iz Ak Nauk SSSR, Ser Geofiz" No 1, pp 78-82

Discusses quant laws governing processes of melting
and freezing of hydrometeors originating during
diffusion transfer of water vapor from particles
to the medium surrounding them. The author finds
the value of the melting threshold of ice particles
and freezing threshold of water drops for abso-
lutely dry air. Thanks N. P. Tverskaya, V. D.
Tret'yakov and V. Ya. Nikandrov.

241T37

SHISHKIN, N.S.

USSR .

551.577.1

7918. The dimensions of raindrops. N. S. SHISHKIN.
Dokl. Akad. Nauk SSSR, 90, No. 2, 171-4 (1953) in
Russian.

A theoretical study of the way in which drop size
depends upon the combination of condensation,
coagulation, gravitation and upward air velocity.

M. HOGG

100
MGT

PHASE I TREASURE ISLAND BIBLIOGRAPHICAL REPORT AID 450 - I

BOOK Call No.: QC921.S47
Author: SHISHKIN, N. S.
Full Title: CLOUDS, PRECIPITATION AND THUNDERSTORM ELECTRICITY
Transliterated Title: Oblaka, osadki i grozovoye elektrichestvo
Publishing Data
Originating Agency: None
Publishing House: State Publishing House of Technical and
Theoretical Literature
Date: 1954 No. pp.: 280 No. of copies: 4,000
Editorial Staff: None

Text Data

Coverage: This is a study of physical phenomena occurring in clouds and leading to the formation of precipitation and thunderstorm electricity, and an account of the principles of the quantitative theory of these phenomena. The author examines the investigations of foreign scientists. The author expresses the opinion that Soviet investigations are frequently ignored by foreign scientists. The introduction presents a short historical sketch of the development of this branch of meteorology. Names of Russian and foreign scientists, descriptions of their methods of investigation and instruments and accounts of their observations (with date and place) are scattered through the book.

1/2

Oblaka, osadki i grozovoye elektrichestvo

AID 450 - I

The book is provided with illustrations, tables and charts.

TABLE OF CONTENTS

	PAGES
Introduction	5-11
Ch. I General Information on Clouds and Precipitation	12-60
Ch. II Modern Methods of Investigation of Clouds and Precipitation	61-80
Ch. III Structure of Clouds	81-102
Ch. IV Laboratory Investigations of Processes Leading to Precipitation	103-127
Ch. V Condensation Growth of Cloud Particles	128-159
Ch. VI Coagulation Growth of Cloud Particles	160-179
Ch. VII Phase Transformations of Hydrometeors	180-197
Ch. VIII Fundamentals of the Theory of Summer Precipitation	198-235
Ch. IX Electric Structure of Clouds	236-256
Ch. X Fundamentals of the Theory of Thunderstorm Electricity	257-273

Purpose: The monograph is intended for meteorologists and geophysicists, scientific workers, teachers in universities and technical schools and graduate students

Facilities: None

No. of Russian and Slavic References: Total 156, 93 Russian

Available: Library of Congress.

2/2

SHISHKIN, N. S.

USER/Meteorology - Rain

Card 1/1 Pub. 86 - 15/37

Authors : Shishkin, N. S.

Title : Dimensions of rain drops

Periodical : Priroda 43/10, 90-92, Oct 1954

Abstract : Methods of measuring the sizes of rain drops are described and explanations are given for the difference in size. The formation of hail is also dealt with. Two Russian references (1953 and 1954). Graphs.

Institution : ...

Submitted : ...

SHIFHKIN, N. S. and BUDILOVA, Ye. P.

"Computations of the Quantity of Condensed Moisture in Convective Clouds".
Trudy Gl. geofiz. observ., No 47, pp 49-52, 1954.

A method for calculating the water capacity with the aid of the aerological diagram is proposed by the author. From the diagram is found the change in specific humidity of saturated air during ascent along the wet adiabat. This change represents the quantity of moisture (in grams per kilogram) which can be condensed in a given layer. The possible water content (in grams per cubic meter) is found by division of the amount of the change in humidity into the density of air. Since the water content depends upon the height of the base and upon the temperature at the level of the cloud base, such computations are carried out for various initial conditions.

The water content of clouds at first increases with altitude, and then decreases the faster the lower the temperature of the cloud base; here the dependence of water content on temperature of the lower base is practically linear. The actual water content of clouds can deviate from the computed in consequence of deviation of the vertical temperature gradient in a cloud from the wet-adiabatic, the evaporation of drops from the cloud's periphery, and the displacement of cloud masses

1/2

of various density, and also in consequence of the fall of cloud particles and precipitation. The latter three factors can substantially change the magnitude of the computed water content. The largest ratio of computed and actual water content evidently can be observed in the central portion of rapidly developing convective clouds.
(RZhGeol, No 9, 1955)

SO: Sum No 884, 9 Apr 1956

2/2

SHIMSHIN, N. S.; Kharin, M. A.

"Precipitations From Purely Aqueous Clouds in the Region of Leningrad"
Trudy Gl. Geofiz. Observ., No 47, 1954, 53-56

The authors present data of two flights in the Leningrad region in May and August of 1952 for the study of aqueous clouds that gave intense rains. The investigations of cloudy systems of thermal fronts that indicated according to the temperature distribution the absence of ice crystals, and also investigations of a cloudy system of a cold front, confirmed the possibility of the fall-out of sufficiently intense precipitations from purely aqueous clouds. The sizes of the rain drops near the earth reached 0.7-0.9 mm when the intensity of the rain was of the order of 0.6 mm/hour. Additional investigation of Ms clouds in January 1950 confirms the possibility of the fall-out of precipitations in the fluid phase and during winter time. (RZhGeol, No 9, 1955)

BC: Sum-No 845, 7 Mar 56

"Vertical Development of Convective Clouds Studied from Aircraft"
Dr. M. Leonis, Observ., No 47, 1964, pp 62-64

Rising air flow was observed from aircraft from the side of cumulus clouds. The aircraft was equipped with two meteorographs, microcameras and Zaytsev's parasols. The vertical velocity of rising clouds averaged 0.7-0.9 meters/sec and attained 1.0-1.2 meters/sec during gathering of storm. (RZharia, No 2, 1965)

SO: Sum. 40., 12 May 65

SHISHKIN, N. S.

"Data of Certain Measurements of the Size of Drops of Storm and Shower Rains".
Trudy Gl. Geofiz. Observ., No 47, pp 94-95, 1954.

Results of systematic measurements of the sizes of raindrops, which were carried out in 1952-1953 in Leningrad, are briefly expounded. Under investigation were 16 storm rains and 45 showers without thunderstorm phenomena. The measurements were conducted by the filter paper method. Comparing the size distribution of the drops for storm and shower rains the author arrives at the conclusion that storm rains differ sharply according to total spectrum from nonstorm rains. The mean value of the maximum radius of drops for storm rains according to 1952 data amounts to 1.5 mm and for shower rains it amounts to 1.0 mm; corresponding values obtained in 1953 are 1.8 and 1.2 mm. The maximum size of drops in storm rains is 2.6 mm. It is confirmed that out of 4,204 drops in storm rains the radius of only 10 drops exceeded 1.5 mm. Hence in the author's opinion it follows that there are no grounds for considering that the Gezekhus effect plays the main role in the development of storm phenomena. (RZhGeiol, No 11, 1955)

SO: Sum No 884, 9 Apr 1956

SHISHKIN, N.S.

Effect of size distribution of cloud particles on the size of rain
drops. Trudy GGO no.54:78-80 '55. (MLRA 9:8)
(Drops) (Rain and rainfall)

SHISHKIN, N.S.

Using the layer method for forecasting the vertical force of
convective clouds. Trudy GGO no.54:96-102 '55. (MLRA 9:8)
(Clouds) (Atmospheric temperature)

SHISHKIN, N.S.

Study of sky conditions producing precipitation in the form of
snow. Trudy GGO no.57:111-112 '56. (MIRA 10:1)
(Snow) (Clouds)

SHISHKIN. N.S.

Some results of studying storm and rain clouds. Trudy GGO no.63:3-21
'56. (MLA 10:5)

(Clouds)

NIKANDROV, V.Ya., kand.fiz.-mat.nauk, red.; SHISHKIN, N.S., doktor fiz.-mat.
nauk, red.; SHIFRIN, K.S., doktor fiz.-mat.nauk, red.; SOLOV'YEV,
V.A., kand.fiz.-mat.nauk, red.; PISAREVSKAYA, V.I., red.;
SOLOVEYCHIK, A.A., tekhn.red.

[Investigations of clouds, precipitation, and thunderstorm
electricity] Issledovanie oblakov, osadkov i grozovogo elektri-
chestva; sbornik dokladov V Mezhvedomstvennoi konferentsii po
voprosam issledovaniia oblakov, osadkov i grozovogo elektrichestva.
Leningrad, Gidrometeor. izd-vo, 1957. 214 p. (MIRA 11:6)

1. Russia (1923- U.S.S.R.) Glavnoye upravleniye gidro-
meteorologicheskoy sluzhby.
(Clouds) (Atmospheric electricity)
(Precipitation (Meteorology))

SHISHKIN, N.S.

Predicting thunderstorms and showers by layer method. Meteor. i
gidrol. no.8:14-20 Ag '57. (MLRA 10:8)
(Thunderstorms) (Weather forecasting)

36-74-2/5

AUTHOR Shishkin, N. S.

TITLE: Mechanism of Hail Formation (O mekhanizme obrazovaniya grada)

PERIODICAL: Trudy Glavnoy geofizicheskoy observatorii, 1957, Nr 74, pp 32-40 (USSR)

ABSTRACT: The author reviews the available information on hail formation during hailstorms when rapidly ascending currents of air are present (or actually induce the storm) and when raindrops become ice pellets (at temperatures below freezing). The author explains how the embryo of the future hailstone grows to a size of 40-50 microns and how the element of diffusion in water vapor stops playing its decisive role in the growth of the pellet. It is the coagulation of independent pellets that accounts for their consequent development into a visible hailstone; some of the hailstones grow to a size 30 centimeters in diameter and weigh 10 kilograms. The relationship between the diameter of the hailstone and the velocity of ascending air currents is examined.

Card 1/2

SHISHKIN, N. S.

AUTHOR: Khmaladze, G. N.

50-1-25/26

TITLE: The Scientific Session of Tbilisi Scientific Research
Institute for Hydrometeorology (Nauchnaya
sessiya Tbilisskogo NIGMI)

PERIODICAL: Meteorologiya i Gidrologiya, 1958, Nr 1, pp. 66-67 (USSR)

ABSTRACT: In May 1957 this institute held its fourth scientific session, where 16 lectures devoted to various branches of the hydrometeorological science were held. Under the conditions of Transcaucasia the problem of the forecast of thunderstorms is of great practical importance, therefore special attention was paid to the lecture by Guniya, S. U. on the method of forecasting thunderstorms under the mountainous conditions of Transcaucasia and the lecture by Shishkin, N. S. (Main Geophysical Observatory) on the topic of the forecast of thunderstorm-processes according to the method of layers. Papinashvili, K. I., Napetvaridze, Ye. A. and Lominadze, V. P. dealt with the problems of the investigation and subdivision of the air- and turbulence-currents above Transcaucasia. Vorontsov, P. A. reported on some peculiarities of the temperature- and wind-conditions above the lake Sevan.

Card 1/2

The Scientific Session of Tbilisi Scientific Research
Institute for Hydrometeorology.

50-1-25/26

Kvaratskheliya, I. F., Tsutskiridze, A. Ya. and Kurdiani, I. G. (State University Tbilissi) reported on the results of their works in the field of the aeroclimatic characteristic of the free atmosphere, on the analytical method of the treatment of observations with pilot balloons and distribution of clouds in Georgia.

Chirakadze, G. I. and Giginayshvili, V. M. explained the scheme of the radiation method of plotting the slipperiness of ice in Transcaucasia and the characteristic of slush and its distribution in Transcaucasia. Khmaladze, G. N., Tsomaya, V. Sh. and Poklepa, V. F. reported on the duration of the vernal-aestival floods in the rivers of Transcaucasia and on the method of their calculation as well as on the method of the determination of the water supplies in the snow according to given records of snow routes.

Tsertsvadze, Sh. I. held a lecture on the method of forecasting the main phenophases of grapes in Georgia, Svanidze, V. F. - on the characteristic of the agro-meteorological conditions of the cultivation of potatoes, various conditions of the cultivation of potatoes, various terms for planting in the low grounds of valleys of East Georgia.
Library of Congress

Card 2/2
AVAILABLE:

1. Weather forecasting 2. Meteorology

3(9)

PHASE I BOOK EXPLOITATION

SOV/2268

Glavnaya geofizicheskaya observatoriya

Voprosy fiziki atmosfery (Problems in Physics of the Atmosphere) Leningrad, Gidrometeoizdat, 1959. 74 p. (Series: Its: Trudy, vyp. 82) Errata slip inserted. 1,250 copies printed.

Sponsoring Agency: Glavnoye upravleniye gidrometeorologicheskoy sluzhby pri Sovete Ministrov SSSR.

Ed. (Title page): N. S. Shishkin, Doctor of Physical and Mathematical Sciences; Ed. (Inside book): T. V. Ushakova; Tech. Ed.: M. I. Braynina.

PURPOSE: This issue of the Observatory's Transactions is intended for students and teachers of synoptic meteorology as well as for professionals in the field.

COVERAGE: This collection of articles is mainly concerned with the results of investigations on the physics of the atmosphere carried out in 1956-57 at the GGO, Division for the Physics of Free Atmosphere. The authors discuss the development (formation) and disintegration of convective clouds

Card 1/3

Problems in Physics (Cont.)

SOV/2268

and the relationship between the cloud structure and aircraft icing. A new method of affecting supercooled clouds is described. One article is devoted to an analysis of the frontal structure of anticyclones. References accompany each article.

TABLE OF CONTENTS:

Shishkin, N. S. Growth and Disintegration <u>Dispersion</u> of Convective Clouds During Non-stable Stratification of the Atmosphere	3
Vasil'chenko, I. V. Computation of the Characteristics of Convective Cloud Flow	22
Zavarina, M. V. Phase Structure of Clouds and Aircraft Icing The article analyzes the results of observations made at Shosseynaya near Leningrad and at Arkhangel'sk for the purpose of establishing the effect of meteorological conditions on aircraft icing. The probability of icing as a function of cloud forms is presented in several graphs.	26

Card 2/3

SHISHKIN, N S

PHASE I BOOK EXPLOITATION

SOV/4643

Leningrad. Glavnaya geofizicheskaya observatoriya

Voprosy fiziki oblakov i aktivnykh vozdeystviy (Problems in the Physics of Clouds and Active Modification) Leningrad, Gidrometeoizdat, 1960. 93 p. (series: Its: Trudy, vyp. 104) 1,000 copies printed.

Sponsoring Agencies: Glavnaya geofizicheskaya observatoriya imeni A.I. Voyeykova; Glavnoye upravleniye gidrometeorologicheskoy sluzhby pri Sovete Ministrov SSSR.

Ed. (Title page): N.S. Shishkin, Doctor of Physics and Mathematics; Ed. (Inside book): L.P. Zhdanova; Tech. Ed.: A.N. Sergeev.

PURPOSE: This collection of articles is intended for scientific workers in meteorology and for graduate students in hydrometeorological institutes.

COVERAGE: This issue of the Transactions of the Main Geophysical Observatory contains articles dealing with problems of cloud formation and microstructure, and with methods of active modification of clouds and fog. Instruments used in cloud investigation are described, and the use of electronic computers for the

~~Card 1/3~~

SHISHKIN N.S.

PHASE I BOOK EXPLOITATION

SOV/4173
SOV/2-S-102

Leningrad. Glavnaya geofizicheskaya observatoriya

Voprosy fiziki oblakov (Problems in the Physics of Clouds) Leningrad, Gidrometeoizdat, 1960. 102 p. (Series: Its: Trudy, vyp. 102). Errata slip inserted. 1,150 copies printed.

Additional Sponsoring Agency: USSR. Glavnoye upravleniya gidrometeorologicheskoy sluzhby. Ed. (Title page): N. S. Shishkin, Doctor of Physics and Mathematics; Ed. (Inside book): V. S. Protopopov; Tech. Ed.: M. I. Braynina.

PURPOSE: The publication is intended for the scientific workers in meteorology and aerology, as well as for graduate students in these fields.

COVERAGE: This is a collection of 6 articles published as No. 102 of the Transactions of the Main Geophysical Observatory imeni A. I. Voyeykov and dealing with the physics of clouds. Individual articles are concerned with convective clouds and their radar characteristics, the microstructure of supercooled clouds, radar characteristics of thunderstorms, and the problem of the optimum radio wave for detection of cloud systems and precipitation. References accompany each article.

Card 1/2

SHISHKIN, N. S.

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S/531/62/000/126/002/004
I053/I 253

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AUTHORS: Gromova, T.N., Krasikov, P.N., Lenshin, V.T., Mikandrova,
G.T., Khimich, M.A., Shishkin, N.S.

TITLE: Experiments on the application of PbI_2 in water solution
to supercooled clouds

SOURCE: Leningrad. Glavnaya geofizicheskaya observatoriya. Trudy.
no. 126, 1962. Voprosy fiziki oblakov i aktivnykh
vozdystviy, 1c-21

TEXT: Clouds or mists are treated with a combustible water solution
of PbI_2 sprayed out of an air-plane at a pressure of 3-4 atmosphere
through sprayers comprising 32 nozzles 1.2 mm in diameter. The
effect has been observed from an altitude of 0.5-1.0 km over the
upper cloud limit. In cumulus clouds with a vertical capacity of
2 km and over, precipitations have been obtained below $-7^{\circ}C$. Com-
pact strato-cumulus clouds with a capacity of 200-460 m were dis-
sipated below $-15^{\circ}C$. At $\sim -29^{\circ}C$, both the PbI_2 solution and the
water itself produce cloud dissipation. There is 1 table.

Card 1/1