

L 17424-63

EWP(q)/EWT(m)/BDS AFFTC/ASD/ESD-3 RM/JD/JG

ACCESSION NR: AP3004346

S/0078/63/008/008/1876/1882

AUTHORS: Aleksandrov, O. P.; Yory*sh, Z. Y.; Shlayen, Zh. M.

TITLE: Physicochemical properties of hexanitronickelates of lanthanum, cerium and samarium mixed with potassium

SOURCE: Zhurnal neorganicheskoy khimii, v. 8, no. 8, 1963, 1876-1882

TOPIC TAGS: hexanitronickelate, lanthanum, cerium, samarium

ABSTRACT: Authors found in a previous study that mixed potassium hexanitronickelates of the composition $3 KR [Ni(NO_3)_6] \cdot n H_2O$ are formed at equal concentrations of lanthanum, praseodymium and neodymium. In the case of cerium, the composition corresponds to the formula $3 KCe[Ni(NO_3)_6] \cdot n H_2O$. These compounds have a varying composition corresponding to the general formula $m KR[Ni(NO_3)_6] \cdot n K_4 Ni(NO_3)_6$, where the value n/m can vary, depending upon the conditions of formation of the mixed salts and concentration.

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conditions. Authors attempt to clarify the homogeneity of these compounds. These compounds crystallize in a cubic syngony, changing the lattice parameters in the series of the same rare earth element. This is dependent on the change in magnitude of n/m . Specific gravity and refractive index of hexanitronickelates of the same rare earth element decrease with an increase in n/m . These values increase during transition to an element with a lower ionic radius. Thermal stability also increases in accordance with the accumulation of $K_4[Ni(NO_3)_6]$ molecules in the mixed salt molecule. Orig. art. has: 4 figures and 5 tables.

ASSOCIATION: Institut geologii goryuchikh iskopayemykh AN UkrSSR
(Institute for the geology of fossil fuels, AN, UkrSSR)

SUBMITTED: 25Apr62

DATE ACQ: 21Aug63

ENCL: 00

SUB CODE: CH

NO REF SOV: 004

OTHER: 003

Card

2/2

ALEKSANDROV, G.P.; DEMKIV, O.T.; SHEVCHENKO, Yu.V.; SHEREMET'YEV, S.Kh.

Flame-photometric determination of strontium in a methane-air flame
using the SF-5 spectrophotometer. Ukr.khim.zhur. 29 no.6:623-627
'63. (MIRA 16:9)

1. Institut geologii goryuchikh iskopayemykh AN UkrSSR.
(Strontium--Spectra) (Flame photometry)

ALEKSANDROV, G.P.

Production of potassium sulfate from natural sulfate-type
potassium salts. Zhur. prikl. khim. 36 no.12:2636-2641 D'63.
(MIRA 17:2)

1. Institut geologii goryuchikh iskopayemykh AN UkrSSR.

ALEKSANDROV, G.P.; SHEVCHENKO, Yu.V.

Composition and properties of mixed hexanitrocobaltates of
rare-earth elements with potassium. Ukr. khim. zhur. 30
no.1:12-18 '64. (MIRA 17:6)

1. Institut geologii goryuchikh iskopayemykh AN UkrSSR.

ALEKSANDEOV, G.P. [deceased]; SHEVCHENKO, Yu.V.

Effect of temperature on the yield and composition of mixed
hexanitrocobaltates of rare earth elements with potassium.
Ukr. khim. zhur. 31 no.10:1040-1045 '65. (MIRA 19:1)

1. Institut geologii i geokhimii goryuchikh iskopayemykh AN
UkrSSR. Submitted May 28, 1964.

ALEKSANDROV, G.P. [deceased]; SHEREMET'YEV, S. Kh.; CHUDKOVSKAYA, R. Ya.

Flame-photometric determination of lithium in natural potassium salts. Ukr. khim. zhur. 31 no. 11:1197-1200 '65 (MIRA 19:1)

1. Institut geologii i geokhimii goryuchikh iskopayemykh AN UkrSSR.

MOVSHOVICH, I.A., kand.med.nauk; VILENSKIY, V.Ya.; BOLKHOVITIN, S.V.,
inzh.; ALEKSANDROV, G.S.

Device for exercising movements of the hip joint. Ortop., travm.
i protez. 22 no.3:54-56 '61. (MIRA 14:4)

1. Iz klinicheskogo otdeleniya detskoy ortopedii i travmatologii
(zav. - chlen-korr. AMN SSSR prof. V.D. Chaklin) Tsentral'nogo
instituta travmatologii i ortopedii (dir. - deystv. chlen AMN SSSR
prof. N.N. Priorov) i Moskovskogo ortopedicheskogo gosptalya
(nach. - d-r med.nauk S.N. Voskresenskiy).
(HIP JOINT)

ALEKSANDROW, G.T., elektromonter.

Device for removing PR-1 fuses. Energetik 4 no.8:30 Ag '56.(MIRA 9:10)
(Electric fuses)

** ALEKSANDROV, G. V.

CAND PHYSICOMATH SCI.

Dissertation: "Longitudinal Dynamic Stability of an airplane considering the elasticity of its structure."

15 September 49

Mathematics Inst imeni V. A. Steklov, Acad of Sci, USSR

Thesis for degree of Cand. Physicomathematical Sci

SO Vecheryaya Moskva
Sum 71

MATVEYEV, Vsevolod Nikolayevich; ALEKSANDROV, G.V., kand.fiz.-matem.nauk,
retsenzent; SAPRONKIN, L.G., kand.tekhn.nauk, red.; ANIKINA, M.S.,
izd.red.; ROZHIN, V.P., tekhn.red.

[Calculating disturbed motion of an airplane] Raschet vozmushchennogo
dvizheniya samoleta. Moskva, Gos.nauchno-tekhn.izd-vo Oborongiz,
1960. 222 p. (MIRA 14:1)
(Airplanes--Aerodynamics)

ALEKSANDROV, G.V. (Moskva); SVYATODUKH, V.K. (Moskva)

Controlled motions of winged flying craft of various systems in
a plane of symmetry. Inzh. zhur. 3 no.1:3-11 '63. (MIRA 16:10)

(Aeronautics)

(Aircraft—Dynamics)

ALEKSANDROV, G. V.

Quartz

Paramorphosis of quartz to tridymite. Zap. Vses. min. ob., 81, No. 3, 1952

Monthly List of Russian Accessions, Library of
Congress, December 1952. Unclassified

KAZITSYN, Yu.V.; ALEKSANDROV, G.V.

Arrangement of patterns of crystalline structural nets and the
projection of structures on planes of an arbitrary crystal.
Zap.Vses.min.ob-va 85 no.2:187-201 '56. (MLRA 9:9)

1. Fedorovskiy institut, Leningrad.
(Crystallography)

KAZITSYN, Yu.V.; ALEKSANDROV, G.V.

Metasomatic zoning in the argillization of granite-porphyrries in
contact ore bodies. Geol. rud. mestorozh. no.5:91-103 S-0 '59.
(MIRA 13:2)

1. Vsesoyuznyy geologicheskii nauchno-issledovatel'skiy institut,
Leningrad.
(Transbaikalia--Ore deposits)

KAZITSYN, Yu.V.; ALEKSANDROV, G.V.

Concentration of metals in plants growing over molybdenum deposits
in permafrost. Mat. VSEGI no.32:127-134 '60. (MIRA 14:3)
(Siberia, Eastern--Ore deposits)
(Geochemical prospecting)

KAZITSYN, Yu.V.; ALEKSANDROV, G.V.; PAVLOVA, V.V.; PANOV, Ye.N.

Mesozoic metalliferous intrusions in the Olekma-Nerchugan region.
Sov.geol. 5 no.9:61-77 S '62. (MIRA 15:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy geologicheskii institut.
(Olekma Valley--Rocks, Igneous)
(Nerchugan Valley--Rocks, Igneous)

KAZITSYN, Yu.V.; ALEKSANDROV, G.V.

Concerning the remarks by G.T. Volostnykh and others on the
article "Metasomatic zoning in the agrillization of granite-
porphyries in contact ore bodies. Geol.rud.mestorozh. no.5:
101-102 S-0 '62. (MIRA 15:12)
(Agrillization) (Granite) (Porphyry)

ALEKSANDROV, G.V.

Greisenlike rocks containing andalusite in southeastern
Transbaikalia. Dokl. AN SSSR 154 no.5:1103-1106 F'64.

(MIRA 17:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy geologicheskii institut.
Predstavleno akademikom D.S. Korzhinskim.

TIKHOMIROV, N.I.; KOZUBOVA, L.A.; TIKHOMIROV, I.N.; KAZITSYN, Yu.V.;
KHARKEVICH, D.S.; PANOV, Ye.N.; RUDAKOVA, Zh.N.; PAVLOVA,
V.V.; ROZINOV, M.I.; ALEKSANDROV, G.V.; SHATKOV, G.A.;
SOLOV'YEV, N.S.

[Intrusive complexes of Transbaikalia] Intruzivnye komplekсы
Zabaikal'ia. [By] N.I.Tikhomirov i dr. Moskva, Izd-vo
"Nedra," 1964. 214 p. (MIRA 17:7)

ALEKSANDROV, G.Ya.

Supply center for precast reinforced concrete in Krasnodar Territory. Bet. i zhel.-bet. no.10:458-460 0 '61.

(MIRA 14:12)

1. Zamestitel' predsedatelya Krasnodarskogo sovnarkhoza.
(Krasnodar Territory--Precast concrete)

ALEKSANDROV, G. YA.

(The operation of tractor S-50) Moskva, Gos. izd-vo selkhoz lit-ry, 1951.
159 p.

1. Tractors. 2. Agricultural machinery.

ALEKSANDROV, G. Ya.

"Ways and Means of Raising the Productivity of the Machine-Tractor Station,"
Znaniye, Moscow, 1952

ALEKSANDROV, G. Ya.

"Highly Productive Utilization of the Machine-Tractor Park," MTS, 12, No.5,
1952

ALEKSANDROV, Grigoriy Yakovlevich; SORKIN, S., redaktor; LIL'YE, A.,
tekhnicheskiiy redaktor

[Tractor brigade leader's manual] Pamiatka brigadira traktornoj
brigady. [Moskva] Moskovskii rabochii, 1956. 510 p. (MLRA 9:10)
(Tractors)

ALEKSANDROV, I.

Workers' Youth Union in defense of China against Japan's
aggression in 1931-1932. Godishnik mash elekt 8 no.4:41-57
'60.(publ.'61).

ALEKSANDROV, I.

Peaceful coexistence and the class struggle. Sov. profsoiuzy 19
no.18:36-38 S '63. (MIRA 16:12)

ALEKSANDROV, I. (Leningrad)

Champion of the country. Voen. znan. 40 no.2:43-44 F '64.

(MIRA 17:2)

ALEKSANDROV, I. (*Bulgarian*)

Intrapulmonary pressure upon lifting weights. Doklady BAN 14 no.7:
763-766 '61.

1. Predstavleno akad. D. Orakhovats.

(Weight lifting)

USSR/Cultivated Plants. Technical Plants. Oil and M
Sugar Bearing Plants.

Abs Jour : Ref Zhur-Biol., No 15, 1958, 68294

Author : Aleksandrov, I.

Inst : -

Title : Oil Content and Yields in Several Sunflower
Strains.

Orig Pub : Zemelcheliye i zhivotnovodstvo Moldavii,
1957, No 8, 16-20

Abstract : On the basis of results of tests which were
conducted in 1952-1956 on the Moldavian expe-
rimental plots with various sunflower strains,
it is concluded that the VNIINIK 1646 strain,
which is presently in use, produces the best
yields of pods and oil under Moldavian con-

Card no: 1/2

USSR/Cultivated Plants. Technical Plants. Oil and II
Sugar Bearing Plants.

Abs Jour : Ref Zhur-Biol., No 15, 1958, 68294

ditions. The necessity of regularly renovating the seed of this strain is emphasized. This measure permits the productivity of the plants to increase. -- A. M. Smirnov

Card : 2/2

ALEKSANDROV, I., inzh.

Chemical weapons. Voen. znan. 40 no.6:33-34 Je '64.

(MIRA 17:7)

ALEKSANDROV, I.

Contribution of radio amateurs, Radio no.4:3 Ap '64.
(MIRA 17:9)

ALEKSANDROV, I.A.

Some cavitation characteristics of ship propellers. Akust. zhur.7
no.1:87-89 '61. (MIRA 14:4)

1. Akusticheskiy institut AN SSSR, Moskva.
(Cavitation) (Propellers)

S/046/62/008/001/002/018
B139/B102

AUTHOR: Aleksandrov, I. A.

TITLE: Physical nature of the "rotation noise" of an underwater propeller during cavitation

PERIODICAL: Akusticheskiy zhurnal, v. 8, no. 1, 1962, 34 - 41

TEXT: The investigations made by H. H. Hubbard and A. Regier (Ref. 2: Free-space oscillating pressures near the tips of rotating propeller, NACA, 1950, report 996) on the basis of calculations by L. Ya. Gutin (Ref. 1: Zh. tekhn. fiz. 1936, 6, 5, 899 - 909) concerning the sound potential of a propeller are applicable to underwater propellers only if no cavitation exists. The author conducted two test series with stationary models of water propellers. In the first series, spectrograms of the propeller noise were recorded as a function of speeds of 600 - 2000 rpm, in the second series, spectra and noise levels for various rotational speeds by blowing different gases into the propeller zone. The sound frequency range was found to consist mainly of discrete frequencies, and $f = mnz$ (m = number of the harmonic, z = number of blades). However, only part of the discrete components is identical with the rotation sound-frequency range.

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S/046/62/008/001/002/018
B139/B102

Physical nature of the ...

quencies; a great part of the discrete components of the spectrum is not subject to this relation. There is no correlation between the amplitudes of discrete components. The rotational-speed dependence of the pressure for the first harmonic of the "rotation noise" is higher in all tests than the calculated values. If gas is blown in additionally, this pressure increases, but the rate of pressure fluctuation is independent of the rotational speed. On the basis of investigations by A. S. Bebhuk (Ref. 3: Issledovaniye kavitatsionnogo razrusheniya tverdykh tel i poverkhnostnykh plenok v akusticheskoy pole (dissertatsiya), 1960 (Investigation of cavitation destruction of solids and surface films in the sound field (Dissertation), 1960), it may be assumed that the sound pressure increase for the first harmonic of the rotation noise in water is dependent on solubility and diffusion properties of the gas. The author concludes that in the case of cavitation the appearance of harmonics is conditioned by the totality of cavitation bubbles. There are 7 figures and 5 references: 2 Soviet and 3 non-Soviet. The two references to English-language publications read as follows: M. Strasberg. Gas bubbles as sources of sound in liquids. J. Acoust. Soc. America, 1956, 28, 1, 20 - 26; E. E. Williams, P. McNulty. Some factors affecting the inception

Card 2/3

S/046/62/008/001/002/018
B139/B102

Physical nature of the ...

of the cavitation. Cav. Hydrodynamics, 1956, 2p1 - 2p22.

ASSOCIATION: Akusticheskiy institut AN SSSR Moskva (Acoustics Institute
AS USSR, Moscow)

SUBMITTED: December 20, 1960

Card 3/3

ALEKSANDROV, I.A., inzh.

Simplified method for constructing free surface curves for a flow with high kinetic energy and a gradually sloping bottom. Izv.vys. ucheb.zav.;energ. 6 no.1:95-98 Ja '63. (MIRA 16:2)

1. Leningradskiy politekhnicheskii institut imeni M.I. Kalinina.
Predstavlena kafedroy ispol'zovaniya vodnoy energii.
(Hydrodynamics)

ALEKSANDROV, I.A.; SKOBLO, A.I.

Studying the operation of demisters. Izv. vys. ucheb. zav.;
neft' i gaz 3 no.4:73-80 '60. (MIRA 15:6)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti
akademika I.M. Gubkina.
(Oil refineries--Equipment and supplies)

ALEXANDROV, I.A.; GORYACHENKOV, V.G.; YEFIMENKO, V.B.; KORYUKIN, Ya.P.;
KHALIF, A.L.

Obtaining liquefied gas in the refining of oil on the pressure
and vacuum distillation units of petroleum plants. Gaz. prom. 8
no.11:48-50 '63. (GIRA 17:11)

ALEKSANDROV, I.A.; BRESTKIN, A.P.

Coefficients of permissible super saturation in humans during the
inspiration of air and a helium-oxygen mixture. Funk. org. v usl.
izm. gaz. sredy 3:6-9 '64. (MIRA 17:11)

ALEXANDROV, I.A.

Effect of the bearing away of liquid from the upper plate on
the operation of rectifying column. Khim. i tekhn. tsel. i ma-
set 9 no.7:44-50 11 '64. (SRI 10:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut prirodozashchity.

Aleksandrov, I.A.

AUTHOR: ALEKSANDROV, I.A. 20-6-1/42

TITLE: On the Limits of Convexity and Star-Shapedness for Functions Which are Schlicht and Regular in a Circle (O granitsakh vypuklosti i zvezdoobraznosti dlya funktsiy, odnolistnykh i regul'yarnykh v krughe).

PERIODICAL: Doklady Akad.Nauk, SSSR, . 1957, Vol.116, Nr6, pp.903-905(USSR)

ABSTRACT: The class S is assumed to consist of the functions $z = f(w)$, $f(0) = 0$, $f'(0) = 1$ which are holomorph and schlicht in the circle $W : |w| < 1$.
 Theorem 1 : Each function $z = f(w)$ of the class S maps a circle with the center $\omega \in W$ and the radius $\rho \leq R_k$, $R_k = 2 - \sqrt{3 + |\omega|^2}$ on a convex domain. The number R_k cannot be improved without additional restrictions.
 Theorem 2 : Each function from S maps each non-Euclidean circle with the non-Euclidean center $\zeta \in W$ and the non-Euclidean radius $\leq \frac{\pi}{2}$ on a domain which is star-shaped with respect to $f(\zeta)$.
 Let $D_n(a)$ be a closed domain, the points of which can be

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On the Limits of Convexity and Star-Shapedness for Functions
Which are Schlicht and Regular in a Circle

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connected with a by a continuous curve consisting of at most n straight line pieces.

Theorem 3 : If the radius of the circle of theorem 2 is $\leq n \frac{\pi}{2}$, then the mapping takes place on a domain $D_n(f(\zeta))$.

Theorem 4 : Each circle which passes through $w=0$ and the radius of which is $\leq \frac{1}{4}$, is mapped by each function from S on a domain which is star-shaped with respect to $z=0$.

Theorems 5,6,7 : Each circle with the center in $ae^{i\alpha}$, $a < \frac{1}{4}$, $0 \leq \alpha \leq 2\pi$ (or : in $w=0$; or : in $\zeta = ae^{i\alpha} \in W$) containing $w=0$ in the interior (or : - , or : -) is mapped by each function from S on a domain which is star-shaped with respect to $z=0$ (or : which is star-shaped with respect to the image of its point ζ , $|\zeta| = a$; or : which is star-shaped with respect to the image of the center), if its radius r satisfies the inequality

$$\ln \frac{1-a+r(\sin x - \cos x)}{1-a-r(\sin x + \cos x)} \leq \arctg \frac{r+a \cos x}{a \sin x}$$

Card 2/4 where x , $0 < x < \pi$ is determined from

On the Limits of Convexity and Star-Shapedness for Functions
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$$\sqrt{r^2 - 2ar \cos x + a^2} = \frac{r \sin x}{1 - a - r \cos x} \quad \left(\text{or : if } r \text{ satisfies} \right.$$

the inequality

$$\ln \frac{\sqrt{1 - 2ar \cos x + a^2 r^2} + \sqrt{r^2 - 2ar \cos x + a^2}}{\sqrt{1 - 2ar \cos x + a^2 r^2} - \sqrt{r^2 - 2ar \cos x + a^2}} \leq$$

$$\leq \operatorname{arc} \operatorname{tg} \frac{r(1+a^2) - a(1+r^2) \cos x}{a(1-r^2) \sin x}$$

where x , $0 < x < \pi$ is determined from

$$\frac{a(1-r^2)[r(1+a^2) \cos x - a(1+r^2)]}{[r(1+a^2) - a(1+r^2) \cos x]^2 + a^2(1-r^2)^2 \sin^2 x} =$$

$$= \frac{2ar \sin x}{\sqrt{(1 - 2ar \cos x + a^2 r^2)(r^2 - 2ar \cos x + a^2)}}$$

or if r satisfies the inequality

$$\ln \frac{(1-a)(\sin x + \cos x) - r}{(1-a)(\sin x - \cos x) + r} \leq \operatorname{arc} \operatorname{tg} \frac{1-a^2 - ar \cos x}{ar \sin x}$$

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On the Limits of Convexity and Star-Shapedness for Functions
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where x , $0 < x < \pi$ is determined from

$$\sqrt{(1-a^2)^2 - 2ar(1-a^2)\cos x + a^2r^2} = \frac{r(1-a)\sin x}{(1-a)\cos x - r} \quad)$$

There are 4 references, 2 of which are Slavic.

ASSOCIATION: Tomsk State University imeni V. V. Kuybyshev (Tomskiy gosudarstvennyy universitet im. V. V. Kuybysheva)

PRESENTED: By M.A. Lavrent'ev, Academician, May 6, 1957

SUBMITTED: May 4, 1957

AVAILABLE: Library of Congress

Card 4/4

Jan
ALEKSANDROV, I.A., Cand Phys Math Sci -- (diss) "Concerning the
fields of ^{values} meanings of certain functionals on the class of
functions which are regular and ^{one-sheeted} ~~one~~ in the circle."

Tomsk, Pub House of Tomsk Univ, 1958, 7 pp (Min of Higher
Education USSR. Tomsk State Univ im V.V. Kuybyshev) 100 copies
Bibliography: p 7 (13 tit^{le}s) (KL, 23-58, 101)

AUTHOR: ~~Aleksandrov, I.A.~~ SOV/140-58-6-1/27

TITLE: On the Conditions of Convexity for the Image-Domains for Mappings of the Domain by Schlicht Functions in the Unit Circle
(Ob usloviyakh vypuklosti obrazov oblasti pri otobrazhenii yeye regul'yarnymi odnolistnymi v yedinitsykh funktsiyami)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Matematika, 1958, Nr 6, pp 3-6 (USSR)

ABSTRACT: Theorem: Let B be a simply connected convex domain bounded by the smooth curve C: $w = \omega + r(\psi)e^{i\psi}$, $\omega \in B$; let $K(\psi)$ be the curvature of C; let B lie in the unit circle W; let M be the class of schlicht functions regular in W. The necessary and sufficient condition that the image of B is convex for a mapping by a function of M, is the inequation

$$\frac{2s(\varphi)}{\sqrt{r^2(\psi) + r'^2(\psi)}} \left[r(\psi)\cos(\psi - \varphi) + r'(\psi)\sin(\psi - \varphi) \right] +$$

$$+ [1 - s^2(\varphi)] K(\psi) \geq 4,$$

where $\varphi(\varphi)e^{i\varphi} = \omega + r(\psi)e^{i\psi}$. The inequation has to be satisfied in all points of C.

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On the Conditions of Convexity for the Image-Domains for SOV/140-58-6-1/27
Mappings of the Domain by Schlicht Functions in
the Unit Circle

There are 2 Soviet references.

ASSOCIATION: Tomskiy gosudarstvennyy universitet imeni V.V. Kuybysheva
(Tomsk State University imeni V.V. Kuybyshev)

SUBMITTED: March 10, 1958

Card 2/2

16(1)

SOV/44-59-9-8998

Translation from: Referativnyy zhurnal. Matematika, 1959, Nr 9, p 66 (USSR)

AUTHOR: Aleksandrov, I. A.

TITLE: The Range of Values of the Functional $I = \frac{w^n f^{(m)}(w)}{f^n(w) |I(w)|^1}$ in the Class S_p

PERIODICAL: Uch. zap. Tomskogo un-ta, 1958, Nr 32, 41-51

ABSTRACT: In the class S_p of p-symmetrical schlicht functions the range of values of the functional given in the title is determined. A short communication was published earlier (Referativnyy zhurnal. Matematika, 1959, 1406)

N. A. Lebedev

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16(1)

AUTHOR: Aleksandrov, I. A.

SOV/140-59-4-2/26

TITLE: On the Star-Form of Mappings of a Domain by Schlicht Functions Regular in the Circle

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Matematika, 1959, Nr 4, pp 9 - 15 (USSR)

ABSTRACT: Theorem : Let B be a simply connected domain belonging to the circle W which is bounded by the smooth curve Γ :
 $w = \omega + r(\varphi)e^{i\varphi}$, where $r(\varphi)$ is unique. For the star-form of the image of B with respect to $f(\omega)$ under the mapping of W by a regular schlicht function $z = f(w)$ it is necessary and sufficient :

$$\ln \frac{|1 - \bar{\omega}w| + |w - \omega|}{|1 - \bar{\omega}w| - |w - \omega|} \leq \min \{ \pi - \psi, \psi \} \quad \text{in all points of } \Gamma, \text{ where } r' \leq 0, \text{ and}$$

$$\ln \frac{|1 - \bar{\omega}w| + |w - \omega|}{|1 - \bar{\omega}w| - |w - \omega|} \leq \min \{ \pi + \psi, -\psi \} \quad \text{in all points of } \Gamma, \text{ where } r' > 0.$$

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On the Star-Form of Mappings of a Domain by
Schlicht Functions Regular in the Circle

30V/140-59-4-2/26

Here it is $\psi = \arctg \left(-\frac{r}{r'} \right) + \arg (1 - \bar{\omega} w)$.

The author presents further five theorems of related character which can be partly directly concluded from the given theorem.

There are 3 Soviet references.

ASSOCIATION: Tomskiy gosudarstvennyy universitet imeni V.V. Kuybysheva
(Tomsk State University imeni V.V. Kuybyshev)

SUBMITTED: June 10, 1958

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ALEKSANDROV, I. A.

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PHASE I BOOK EXPLOITATION

SOV/3981

Issledovaniya po sovremennym problemam teorii funktsiy kompleksnogo peremennogo; sbornik statey (Investigation of Modern Problems in the Theory of Complex Variables; Collection of Articles) Moscow, Fizmatgiz, 1960. 544 p. 3,000 copies printed.

Ed. (Title page): A. I. Markushevich; Eds. (Inside book): V. S. Videnskiy and S. Ya. Khavinson; Tech. Ed.: N. Ya. Murashova.

PURPOSE: This book is intended for specialists in the theory of functions of a complex variable. It may also be used by advanced university students, scientific workers, and specialists in other fields of mathematics.

COVERAGE: The book contains 48 papers originally read at the Third All-Union Conference on the Theory of Functions of a Complex Variable held at Moscow University from May 28 to June 2, 1957. The articles treat problems in the modern theory of functions and its applications. The book is divided into 7 parts. The first part discusses the problem of monogeneity, power series, boundary and extremal properties. The second part discusses entire functions and interpolation and approximation problems. The third part

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discusses functions of many complex variables. The fourth part discusses conformal mappings and boundary-value problems. The fifth part discusses Riemann surfaces and the theory of distribution of values. The sixth part discusses generalized analytic functions, and the seventh part discusses miscellaneous problems. No personalities are mentioned. References accompany each article.

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AUTHOR: Aleksandrov, I. A.

TITLE: Variational problems for star-like functions, univalent in the unit circle

PERIODICAL: Akademiya nauk Armyanskoy SSR. Izvestiya. Seriya fiziko-matematicheskikh nauk, v. 14, no. 4, 1961, 7-19

TEXT: This material was presented to the 5th All-Union Conference on the theory of functions of a complex variable, held at Yerevan in September, 1960. Let S_p^* be the class of regular functions

$$z = f(w) = w + \sum_{k=1}^{\infty} c_{pk} + 1 w^{pk} + 1 \quad (1.1)$$

univalent in the circle $W: |w| < 1$, which map W onto regions with

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p-fold rotational symmetry with respect to the point $z=0$, being star-like with respect to that point. It is assumed that the function $I=I(x_0, y_0, x_1, y_1, \dots, x_n, y_n)$ is given for any finite complex values of the arguments, and that it is continuous together with its derivatives, to second order inclusive. The functional

$$I = I[f(w), \overline{f(w)}, f'(w), \overline{f'(w)}, \dots, f^{(n)}(w), \overline{f^{(n)}(w)}] \quad (1.2)$$

is considered on the class S_p^* ; it is required to find the set D of its values. D , as a closed, connected set, is called the domain D . The limit points of D are denoted by I_0 ; the functions which assume the value I_0 in D , are called limit functions. In order to find the limit functions, the variational method is used. The author showed (in an earlier work) that, together with the function $f(w)$, the function

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$$f_*(w) = f(w) + tP(w, w_0)f(w) + o(t), \quad t > 0 \quad (1.3)$$

also belongs to S_p^* ; here

$$\begin{aligned} P(w, w_0) = & A \left[\frac{w^p + w_0^p}{w^p - w_0^p} + H(w) \right] + \bar{A} \left[\frac{1 + \bar{w}_0^p w^p}{1 - \bar{w}_0^p w^p} - H(w) \right] - \\ & - \frac{A}{\bar{H}_0} \left[H(w) \frac{w^p + w_0^p}{w^p - w_0^p} + 1 \right] + \frac{\bar{A}}{\bar{H}_0} \left[H(w) \frac{1 + \bar{w}_0^p w^p}{1 - \bar{w}_0^p w^p} - 1 \right] \end{aligned} \quad (1.4)$$

A is a complex constant, w_0 is any (fixed) point of W,

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$$H(w) = \frac{wf'(w)}{f(w)}, \quad H_0 = H(w_0) \quad (1.5)$$

$O(t)$ is a small quantity. The following theorem is proved, which yields the sought-for functions. Theorem 1: Let S^* be the class of regular, univalent functions $z=f(w)$, $f(0) = 0$, $f'(0) = 1$, which possess p -fold symmetry with respect to the origin. Let $I = I f(w)$, $f(w)$, ..., $f^{(n)}(w)$, $\overline{f^{(n)}}(w)$ be a functional, defined on S_p^* , which is continuous with its derivatives up to second order inclusive. Then the limit points of the domain of values of this functional satisfy functions of type

$$F(w) = \frac{w}{\prod_{l=1}^{2(n+1)} (1 - e^{-ip\theta_l} w^p)^{\frac{\mu_l}{p}}}$$

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$$\text{where } \mu_1 \geq 0, \quad \sum_{l=1}^{2(n+1)} \mu_l = 2$$

These functions map the unit circle on p-symmetrical regions which form the entire plane, cut by at most $2p(n+1)$ rays, whose continuation passes through the origin. By slightly modifying the proof of theorem 1, a very general theorem is obtained. The integral

$$I = \int_S y [f(w), \overline{f(w)}, \dots, f^{(n)}(w), \overline{f^{(n)}(w)}] ds \quad (2.1)$$

is considered, taken over a piecewise-smooth arc of W , or over a region of W with smooth boundary. Theorem 2: In the domain D of values of the functional I (defined by Eq. (2.1)), on the class S_p^* ,

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the limit points satisfy the functions

$$f(w) = \frac{w}{\prod_{l=1}^m (1 - e^{-ip\theta_l} w^{\frac{\mu_l}{p}})}, \text{ where } \mu_l > 0, \sum_{l=1}^m \mu_l = 2 \quad (2.2)$$

Unlike in Theorem 1, the number of cuts cannot be estimated in this case. In particular problems it is convenient to obtain new functions by elementary variations of the subclass of functions (2.2). Such a new function is obtained by varying by δ the argument of one of the points which are images of the point $z = \infty$. Another variation is obtained by assuming that $f(w)$ is bounded by at least two groups of rays, each of which consisting of rays which are brought to coincide by rotation of $f(w)$ (by an angle which is a multiple of $2\pi/p$) about the origin; the variation is obtained by rotating one of the groups of rays by the small angle δ . Determin-

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nation of the domain D of a functional I of type (1.2) on S_p^* , reduces (by Theorem 1) to finding the minimum of the function $|I - I_e|$, $I_e \in D$. Thus the problem reduces to finding the minimum of a function of a finite number of variables; hence it can be solved by elementary methods. Further, 3 simple problems are considered. Estimate of coefficients for class S_p^* : For the coefficients a_{kp+1} , $k = 1, 2, 3, \dots$ of the functions

$$f(w) = w + \sum_{k=1}^{\infty} a_{kp+1} w^{kp+1} \in S_p^*$$

the estimate

$$|a_{kp+1}| \leq (-1)^k \left[\frac{2}{p} \right]_k = \frac{1}{k!} \frac{\Gamma\left(\frac{2}{p} + k\right)}{\Gamma\left(\frac{2}{p}\right)} = \frac{1}{kB\left(\frac{2}{p}, k\right)}$$

(3.7)

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holds; the equality sign holds for the function

$$f(w) = \frac{w}{(1 - e^{-ip\theta_w p})^{2/p}}$$

Domain of values D of the functional $I = \ln \frac{f(w_0)}{w_0}$ on the class S_p^* :
The limit points of D are determined by

$$I_0 = -\frac{2}{p} \ln(1 - |w_0|^p e^{i\psi}) \quad (3.10)$$

where

$$\psi = \alpha - \arcsin(|w_0|^p \sin \alpha) \quad (3.11)$$

The limit functions are

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$$f(w) = \frac{w}{(1 - e^{-ip\theta} w^p)^{2/p}} \quad (3.12)$$

where

$$-p\theta = \alpha - \arcsin(|w_0|^p \sin \alpha) - p \arg w_0 \quad (3.13)$$

Domain D of $I = \frac{w_0 f'(w_0)}{f(w_0)}$ on S_p^* . The domain of values D of the functional I on S_p^* is a circle with the center at the point $\frac{1+|w_0|^{2p}}{1-|w_0|^{2p}}$ and radius $\frac{2|w_0|^p}{1-|w_0|^{2p}}$. The limit functions are

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$$f(w) = \frac{w}{(1 - e^{-ip\theta_w})^{2/p}}$$

$$\text{where } e^{-ip\theta} = \frac{|w_0|^p e^{-i\alpha}}{1 + |w_0|^p e^{-i\alpha}}$$

There are 3 Soviet-bloc references.

ASSOCIATION: Tomskiy gosudarstvennyy universitet im. V. V. Kuybysheva (Tomsk State University im. V.V. Kuybyshev)

SUBMITTED: January 15, 1961

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ALEKSANDROV, I.A.

Boundary values of the functional $J J(f, \bar{f}, f', \bar{f}')$ on a class of
holomorphic functions one-sheeted in a circle. Sib.mat.zhur. 4
no.1:17-31 Ja-F '63. (MIRA 16:2)

(Functions, Analytic)

L 39386-65 EWT(d)/T IJP(c)

ACCESSION NR: AR5004792

S/0044/64/000/011/B028/B028

AUTHOR: Aleksandrov, I. A.

SOURCE: Ref. zh. Matematika, Abs. 11B120

TITLE: Variation of non-single-sheet analytic functions

CITED SOURCE: Tr. Tomskogo un-ta, v. 163, 1963, 155-159

TOPIC TAGS: analytic function, variational formula, complex variable

TRANSLATION: The author obtained a variational formula in the class S^* of the functions $z = f(w)$, $f(0) = 0$, $f'(0) = 1$, regular and star-like in the circle $|w| < 1$, on the basis of the well-known variation formula of G. M. Goluzin in the class of regular single-sheet functions. It is shown in the abstracted paper that this formula makes it possible to obtain variations in several other classes of functions which are regular in the circle $|w| < 1$. Using the one-to-one cor-

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ACCESSION NR: AR5004792

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correspondence between the class S^* and the class K of the functions $h(w)$, $h(0) = 1$, regular in the circle $|w| < 1$ and having a positive real part in it, the author obtains a variational formula in class K . In the same manner a variational formula is derived in the paper in class U of functions $\omega(w)$, $\omega(0) = 0$, which are regular in $|w| < 1$, and which assume values only from the circle $|\omega| < 1$. It is noted that by using a similar reasoning it is possible to obtain variational formulas also in other classes of analytic functions, if a one-to-one correspondence is established between each of these classes and the class S^* . By way of an appendix, the variations obtained for functions that are regular in the circle $|w| < 1$ and are subject in it to a given single-sheet or non-single-sheet majorant, G. Kuz'mina.

SUB CODE: MA

ENCL: 00

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S/199/63/004/002/001/013
B172/B186

AUTHORS: Aleksandrov, I. A., and Chernikov, V. V.

TITLE: Extremum properties of star-shaped mappings

PERIODICAL: Sibirskiy matematicheskiy zhurnal, v. 4, no. 2, 1963, 241-267

TEXT: $J = J(t_1, t_2, \dots, t_{(2n+2)k})$ denotes an analytic function of the complex variables t_j for the semi-cylinder $|t_j| < \infty$, $j = 1, 2, \dots, (2n+2)k$. Functionals of the shape $J = J(u_{01}, v_{01}, u_{11}, v_{11}, \dots, u_{n1}, v_{n1}, u_{02}, v_{02}, u_{12}, v_{12}, \dots, u_{n2}, v_{n2}, \dots; u_{0m}, v_{0m}, u_{1m}, v_{1m}, \dots, u_{nm}, v_{nm})$ are considered over certain function classes M , where

$$f^{(s)}(w_k) = u_{sk}, f^{(s)}(w_k) = v_{sk}, f^0(w_t) = f(w_k);$$

w_1, \dots, w_m being points of the domain G in which the functions of the class M are regular. E.g., $M = S_p^*$ ($p = 1, 2, \dots$); S_p^* consists of functions

$$z = f(w) = w + o_{p+1} w^{p+1} + \dots + o_{kp+1} w^{kp+1} + \dots,$$

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regular and unique in the circle $W : |w| < 1$, which map W on domains that are star-shaped with respect to $z = 0$ and have a p -fold rotational symmetry with respect to $z=0$. The aim of this paper is to make statements on the range of values D of a functional J over M . If a point of the contour D corresponds to a function $f(w) \in M$, the latter is called contour function. Furthermore it is shown what shape the contour functions have for the class of functions considered. A number of theorems are given on the special functionals $J = \ln \frac{f(w)}{w}$ and $J = \frac{wf'(w)}{f(w)}$, and also estimates for the coefficients of functions of the classes S_p and K_p .

SUBMITTED: June 22, 1961

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L 15474-63 EWT(d)/FCC(w)/BDS AFFTC/IJP(C)

ACCESSION NR: AP3005424

S/0020/63/151/005/0999/1002

AUTHOR: Aleksandrov, I. A.

TITLE: Variational method for the solution of extremal problems in some classes of analytic functions

SOURCE: AN SSSR. Doklady*, v. 151, no. 5, 1963, 999-1002

TOPIC TAGS: variational method, analytic function, structural formula

ABSTRACT: Author extends the variational method proposed by Schiffer (Am. J. Math., 65, 1943, p. 341) and Goluzin (Matem. sborn. 19 (61), no. 2, 1946, p. 203) to a class of analytic functions whose properties were heretofore studied by other methods, structural formulas in particular. Qualitative characteristics of extremal functions, sometimes sufficient for the determination (with an accuracy up to the parameters) of all extremal functions in such problems, were obtained for sufficiently-generalized extremal problems. Author then uses these functions to prove 5 theorems. Orig. art. has 4 formulas.

ASSOCIATION: Tomsk State University.

Card 1/2

ALEKSANDROV, I.A.

Variational formulae for univalent functions in doubly connected regions. Sib. mat. zhur. 4 no.5:961-976 S-0 '63. (MIRA 16:12)

ALEKSANDROV, I.A.; CHERNIKOV, V.V.

Extremum properties of one-sheeted star-shaped mappings. Sib.mat.
zhur.4 no.6:1201-1207 N-D '63. (MIRA 17:9)

ALEKSANDROV, I.A.

Some estimates for holomorphic functions of several complex
variables. Sib. mat. zhur. 5 no.1:3-13 Jan '64.

(MIRA 17:7)

ALEKSANDROV, I.A.; LEVINA, Ye.S., red.

[Rectification and absorption apparatus; methods of calculation and principles of design] Rektifikatsionnye i absort-tsionnye apparaty; metody rascheta i osnovy konstruirovaniia. Moskva, Khimiia, 1965. 307 p. (MIRA 18:8)

ALEKSANDROV, I.A.; TUREVSKIY, Ye.N.

Maximum permissible load on absorption columns with overflow
plates. Gaz. delo no.10:21-24 '65 (MIRA 18:12)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut prirodnogo gaza.
Submitted April 23, 1965.

L 11591-66 EWT(d) IJP(c)

ACC NR: AP6002412

SOURCE CODE: UR/0020/65/165/005/0983/0986

AUTHORS: Aleksandrov, I. A., Gutlyanskiy, V. Ya. 14

ORG: Tomsk State University im. V. V. Kuybyshev (Tomskiy gosudarstvennyy universitet)

12, 44, 55
TITLE: Extremal problem in classes of analytic functions having structured formula

SOURCE: AN SSSR. Doklady, v. 165, no. 5, 1965, 983-986

TOPIC TAGS: complex variable, calculus of variations

ABSTRACT: The main results of this study are contained in a set of theorems which show that boundary functions with respect to $I(f)$ (bounded complex valued functional) are contained in a given class of functions. The method of variations of the Stieltjes integral due to G. M. Goluzin (Uch. zap. LGU, No. 144, v. 23, 1952) is used. These results are applied to extremal problems posed for classes of star-shaped holomorphic bounded functions, usually real, and others as well. This paper was presented by academician M. A. Lavrent'yev on 13 April 1965. Orig. art. has: 8 formulas.

SUB CODE: 12/ SUBM DATE: 07Apr65/ ORIG REF: 006

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UDO: 517.34

ACC NR: AP7013147

SOURCE CODE: UR/0199/66/007/006/1209/1215

AUTHOR: Aleksandrov, I. A.

ORG: none

TITLE: Majorant domains for functionals on families of holomorphic functions of many complex variables

SOURCE: Sibirskiy matematicheskiy zhurnal, v. 7, no. 6, 1966, 1209-1215

TOPIC TAGS: function theory, function analysis, holomorphic function

SUB CODE: 12

ABSTRACT: The author notes that A. A. Temlyakov and I. I. Bavrín evaluated a number of real expressions characterizing Schur, Caratheodory, and other functions in each of the domains of a special class of complete polycircular domains of the space C^n of the variables z_1, \dots, z_n ($n = 2, 3, \dots$). The present article considers the more general problem of sets of values of analytic complex-valued functional on families of holomorphic functions in arbitrary bounded complete polycircular domains and indicates methods for finding majorants for these sets. Orig. art. has: 9 formulas. [JPRS: 40,100]

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UDC: 517.55

0933 0856

ALEKSANDROV, I.A.; GORECHENKOV, V.G.; KHALIF, A.I.; KRZHIZHEVSKAYA, N.G.

Hydraulic calculation of grid-plate columns. Gaz.prom. 10 no.3:20-46
165. (MIRA 18:5)

SKOBLO, A.I.; ALEKSANDROV, I.A.

Effect of the entrainment of liquids on the number of plates in
rectification columns. Trudy MINKHIGP no.28:80-92 '60.
(MIRA 14:4)

(Plate towers)

ALEKSANDROV, I.A.

Graphic calculation of the feed plate of the full rectification column based on a thermal diagram. Izv. vys. ucheb. zav.; neft' i gaz 3 no.9:87-90 '60. (MIRA 14:4)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti imeni akademika I.M.Gubkina.
(Plate towers)

ALEKSANDROV, I.A.; SKOBLO, A.I.

Mechanical entrainment of liquid by gases from perforated-type plates. Khim.i tekhn.topl.i masel 5 no.9:42-45 S '60.

(MIRA 13:9)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im.akad.Gubkina.

(Plate towers)

ALEKSANDROV, I.A.; SKOBLO, A.I.

Choosing the amount of fluid entrainment between plates in rectification columns. Izv. vys. ucheb. zav.; neft' i gaz 4 no.3:53-59 '61.
(MIRA 16:10)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. akademika I.M.Gubkina i Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut neftyanogo mashinostroyeniya.

MOLOKANOV, Yu.K.; ALEKSANDROV, I.A.; SKOBLO, A.I.

Experimental investigation of turbogrid-type plates. Khim. i tekhn.
topl. i masel 6 no. 5:34-38 My '61. (MIRA 14:5)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti
im. akademika Gubkina.

(Plate towers)

~~ALEKSANDROV, I.A.~~; SHEYNMAN, V.I.; KOGAN, Yu.S.; SHVETS, Ye.M.;
Prinimali uchastiye: VOI'SHANCK, Yu.Z.; LIZUNKOV, V.P.;
Seregina, A.P.; KAZAKOVA, L.I.; MUSATOVA, Z.D.

Hydrodynamics of plates made of S-shaped elements. Khim.
i tekhn. topl. i masel 6 no. 7: 38-44 J1 '61. (MIRA 14:6)

1. Giproneftemash.
(Plate towers)

ALEKSANDROV, I.A.; SKOBLO, A.I.

Main characteristics and application fields of plates of various design in rectification and absorption columns. Khim. i tekhn. topl. i masel 7 no.1:45-50 Ja '62. (MIRA 15:1)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut neftyanogo mashinostroyeniya i Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. akad.Gurkina.
(Plate towers)

SHEYNMAN, V.I.; ALEKSANDROV, I.A.; KOGAN, Yu.S.; VOL'SHONOK, Yu.Z.;
LIZUNKOV, V.P.; SHVETS, Ye.M.

New design of a plate for rectifications columns. Khim.i tekhn.
topl.i masel 7 no.5:54-60 My '62. (MIRA 15:11)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut
neftyanogo mashinostroyeniya.
(Plate towers)

ALEKSANDROV, I.A.; SKOBLO, A.I.

Determination of the amount of liquid carried off between plates
in rectification columns. Khim.i tekhn.topl.i masel 7 no.8:53-58
Ag '62. (MIRA 15:8)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti
im. akad. Gubkina.

(Plate towers)

SHEYNMAN, V.A., inzh.; KOGAN, Yu.S., inzh.; ALEKSANDROV, I.A., kand.
tekhn.nauk

Comparative hydromatic tests of plates of various designs. Khim.
mashinostr. no.3:15-17 My-Je '63. (MIRA 16:11)

ALEKSANDROV, I.A.

Determination of the basic dimensions of plate rectification
columns. Khim.i tekhn.topl.i masel 8 no.1:50-58 Ja '63.
(MIRA 16:2)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy
institut neftyanogo mashinostroyeniya.
(Plate towers) (Petroleum--Refining)

ALEKSANDROV, I.A.; SHEYNMAN, V.I.; ABROSIMOV, B.Z.; VOL'SHONOK, Yu.Z.

Concurrent spray plates. Khim. i tekhn. topl. i masel 8 no.4:
44-51 Ap '63. (MIRA 16:6)

(Plate towers)

ALEKSANDROV, I.A.

Load on the perforated plates of the rectifying apparatus. Spirt.prom.
29 no.1:6-12 '63. (MIRA 16:2)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut
neftyanogo mashinostroyeniya.
(Distillation apparatus)

~~ALEKSANDROV, I.A.~~

Design and construction of perforated plates. Spirt.prom. 29 no.2:17-23
'63. (MIRA 16:3)

1. Gosudarstvennyy nauchno-issledovatel'skiy i proyektnyy institut
neftyanogo mashinostroyeniya.
(Packed towers)

ALEKSANDROV, I.A.; SKOBLO, A.I.

Determination from the thermogram of the number of rectification column plates taking the entrainment of liquid into account. Izv.vys.ucheb. zav.;khim.i khim.tekh. 6 no.4:675-682 '63. (MIRA 17:2)

1. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. Gubkina. Kafedra neftezavodskogo oborudovaniya.

DYTNEFSKIY, Yu.I.; ALEKSANDROV, I.A.; SHEYNMAN, V.I.; VOL'SHONOK, Yu.Z.;
KUPERMAN, A.M.

Investigating hydraulics and mass transfer regularities in columns with
corrugated downcomerless type plates. Khim.prom. no.1:70-74 Ja '64.
(MIRA 17:2)

ALEKSANDROV, I.A., inzh.

Choice of the parameters for a group of hydroelectric power stations in the dynamic development of a consolidated electric power system. Izv. vys. ucheb. zav.; energ. 7 no.11:93-99 N '64 (MIRA 18:1)

1. Leningradskiy politekhnicheskii institut imeni M.I. Kalinina.
Predstavlena kafedroy ispol'zovaniya vodnoy energii.

L 45892-65 EWG(j)/EWG(r)/ENT(l)/FS(v)-3/EWG(v)/EWG(a)-2/EWG(c) Pb-4/Ps-5
 AFPTG/AFMDC/AMD/ARGG DD
 ACCESSION NR: AT5010591 UR/3147/64/003/001/0006/0009

AUTHOR: Aleksandrov, I. A.; Brestkin, A. P.

TITLE: Coefficients of permissible supersaturation in people breathing air and helium-oxygen mixtures

SOURCE: AN SSSR. Institute evolyutsionnoy fiziologii. Funktsii organizma v usloviyakh izmenennoy gazovoy sredy, v. 3, 1964, 6-9

TOPIC TAGS: respiration, bends, decompression, helium oxygen, oxygen nitrogen, pressure chamber, human physiology

ABSTRACT: The values for the coefficient of permissible supersaturation in subjects breathing air and helium-oxygen mixtures was studied. The authors (aged 28 and 38) tested themselves and 8 divers (aged 20--26) in a large pressure chamber which accommodated 4 subjects at a time. The subjects were saturated with an inert gas (N₂) over a period of 6 hr, which was considered sufficient for 100% saturation. For the following 18 hr, the subjects underwent laboratory examinations. If no symptoms of decompression developed, the subjects were exposed to a pressure 1.5 m H₂O higher than in the previous test. This step increase in pressure progressed

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ACCESSION NR: AT5010591

until minor symptoms of decompression developed. Prior to each test, the chamber was filled one-half full of water (11—14°C) in which the subjects sat in waterproof coveralls without exercising for 6 hr. Air or helium-oxygen mixtures were breathed through a mouthpiece, and expired-gas samples were taken every 15 min. The composition of these samples was 18—21% oxygen and 79—82% helium and nitrogen. Results are given in Table 1.

The results showed that the coefficient of permissible supersaturation for air respiration was 2.4, while that for helium-oxygen respiration was 2.66. The greater value for the helium-oxygen mixture can be explained by the fact that the organism of the divers was better able to release helium bubbles, owing to the large diffusion coefficient of this gas.

Orig. art. has 1 table.

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Table 1. Determination of coefficient of permissible supersaturation

Pressure		No. of subjects	Partial pressure of inert gas (atm)	Cases of decompression symptoms
in H ₂ O	atm			
Breathing air				
12.5	2.25	5	1.78-1.86	none
14.0	2.40	2	1.90	none
15.5	2.55	2	2.01	none
16.5	2.65	2	2.08	none
18.0	2.8	6	2.21-2.32	2 (pruritis)
19.5	2.95	8	2.36-2.40	8
Breathing helium-oxygen				
12.5	2.25	8	1.91-2.02	none
14.0	2.40	4	1.88	none
15.5	2.55	4	2.09	none
16.5	2.65	4	2.13	none
18.0	2.8	4	2.33	none
19.5	2.95	4	2.942	none
21.0	3.10	4	2.46	none
22.5	3.25	8	2.65-2.67	3

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SUBMITTED: 00

ENCL: 00

SUB CODE: PH, 1S

NO REF SOV: 006

OTHER: 001

ATD PRESS: 3240-P

Card 4/4

ALEKSANDROV, I.A.; POPOV, V.I.

Solution of I.E.Basilevich and G.V.Koritskii's problem of star-shaped arcs of level lines. Sib. mat. zhur. 6 no.1:16-37 Ja-F
'65. (MIRA 18:4)