On the distribution of the arithmetical numbers in variable series (Über die Verteilung der allgemeinen Glieder in der Variationsreihe), Kibron /sic/, 12(1935), pp. 59-81.

S : Matematika v SSSR za sorok let, 1:17-1957, Moscow, 1959.

On the distribution of ω^2 (Sur la distribution de ω^2), Comptes rendus (Doklady) de l'Academie des Sciences de l'URSS, 3(1936), pp. 449-452.

In: Matematika v SSSR za sorok let, 1917-1957, Moscow, 1959.

SMIRNOV, N. V.

O raspredelenii ω^2-kriteriya Mizesa. matem. sb., 2 (44), (1937), 973-994.
(On the Distribution of the ω^2 criterion of Mises).

SO: Mathematics in the USSR, 1917-1947
edited by Kurosh, A. G.,
Markushevich, A. I.,
Rashevskiy, P. K.
Moscow-Leningrad, 1948

[illegible]

On the number of alternations of sign in a series of deviations (O chisle peremen znaka v posledovatel'nosti uklonenij), Izvestiya Akademii Nauk SSSR, Seriya Matematicheskaya (1937), pp. 361-372.

SO: Matematika v SSSR za sorok let, 1917-1957, Moscow, 1959.

S.I.[illegible]

Estimate of the variance between empirical curves of distribution in two independent selections (Otsenka variabel'nosti mezhdu empiricheskimi krivymi raspredeleniya v dvukh nezavisimykh vyborkakh), M., Byull. un-ta (A) [Bulletin of Moscow Univ.], 2:2 (1 39), pp. 3-14.

SO: Matematika v SSSR za sorok let, 1 17-1 57, Moscow, 1959.

SMIRNOV, N. V.

"On the Estimation of the Maximum Term in a Series of Observations," Dokl. AN SSSR, 33, No.5, 1941 - pp. 346-9

Steklov Math. Inst., AS USSR

SMIRNOV, N. V.

Priblizheniye zakonov raspredeleniya slucha[illegible]ykh velichin po empiricheskim dannym. Uspekhi matem. nauk., 10 (1944), 179-206.

SO: Mathematics in the USSR, 1917-1947
edited by Kurosh, A. G.,
Markushevich, A. I.,
Rashevskiy, P. K.
Moscow-Leningrad, 1948

1. SMIRNOV, N. V.

2. USSR (600)

4. Physics and Mathematics

7. Application of Mathematical Statistics to Experimental Work, V. I. Romanovskiy. (Moscow, State Technical Press, 1947). Reviewed by N. V. Smirnov, Sov. Kniga, No. 5, 1948.

9. [redacted] Report U-3081, 16 Jan. 1953, Unclassified.

Smirnov, N. V.

Smirnov, N. V. Sur un critère de symétrie de la loi de distribution d'une variable aléatoire. C. R. (Doklady) Acad. Sci. URSS (N.S.) 56, 11–14 (1947).

Let $X_1, \cdots, X_n$ be mutually independent random variables with a common distribution function $F(x)$ which is continuous and symmetric with respect to $x=0$. Let $N^+(x)$ and $N^-(x)$ be the numbers of X_k contained in the intervals $(0, x)$ and $(-x, 0)$, respectively. Put $t_n = \max\{N^+(x) - N^-(x)\}$ and $t_n^* = \max\{|N^+(x) - N^-(x)|\}$. The random variables t_n and t_n^* are integer valued and their distributions are independent of $F(x)$. If the X_k are rearranged in increasing order of $|X_k|$, it is easily seen that $\Pr\{t_n \geqq \nu\}$ equals the probability of a ruin in n trials or less in the classical coin game when the adversary is infinitely rich and the player has an initial capital ν. The distribution of t_n, and similarly of t_n^*, is therefore well known. The result can be used for testing the statistical hypothesis that an unknown distribution is symmetric. *W. Feller* (Ithaca, N. Y.).

Source: Mathematical Reviews, 1948, Vol 9, No. 1

Smirnov, N. V.

Smirnov, N. V. On the distribution of the number of cycles in cyclic systems. Uspehi Matem. Nauk (N.S.) 4, no. 4(32), 192–193 (1949). (Russian)

Let $\tau_1, \tau_2, \cdots$ be mutually independent positive random variables with a common distribution function and let $H(t)$ be the number of partial sums of $\sum_j \tau_j$ lying in the interval $(0, t)$. The author states various theorems on the asymptotic character of $H(t)$ for large t. He is presumably unfamiliar with some of the earlier work in this field [for example, Doob, Trans. Amer. Math. Soc. 63, 422–438 (1948); these Rev. 9, 598].

J. L. Doob (Ithaca, N. Y.).

Source: Mathematical Reviews, Vol 11 No. 3

Smirnov, N. V.

Smirnov, N. V. On the Cramér-Mises criterion. Uspehi Matem. Nauk (N.S.) 4, no. 4(32), 196–197 (1949). (Russian)

The author sketches another derivation of the asymptotic limiting distribution of the ω^2 criterion measuring the discrepancy between a given distribution and the empirical one obtained from a sample. [Cf. his earlier paper, C. R. Acad. Sci. Paris 202, 449–452 (1936).] *J. L. Doob.*

Source: Mathematical Reviews. Vol. 11 No. 4

Smirnov, N.V.

*Smirnov, N. V. Limit distributions for the terms of a variational series. Trudy Mat. Inst. Steklov. 25, 60 pp. (1949). (Russian)

Let $V_{(k,n)}$ be the kth in order of size of n independent chance variables with the same distribution function $F(x)$. This paper deals at great length with the asymptotic distribution $\Phi(x)$ of $(V_{(k,n)}-b_n)/a_n$, where $a_n>0$ and b_n are suitable constants. Most of the results fall into two classes: (a) $n\to\infty$, k constant, (b) $n\to\infty$, $k/n\to\lambda$ (a constant), $n^{\frac{1}{2}}(k/n-\lambda)\to 0$. It is impossible to describe the results within the bounds of a brief review. A sample is given by theorem 7: for the case (b) $\Phi(x)$ can only be one of the following types:

$$(1)\quad \Phi_a^1(x)=(2\pi)^{-\frac{1}{2}}\int_{-\infty}^{x}e^{-u^2/2}du, \qquad x\geqq 0,\ c>0;$$
$$=0, \qquad x<0;$$

$$(2)\quad \Phi_a^2(x)=(2\pi)^{-\frac{1}{2}}\int_{-\infty}^{x}e^{-u^2/2}du, \qquad x<0,\ c>0;$$
$$=1, \qquad x>0;$$

$$(3)\quad \Phi_a^3(x)=(2\pi)^{-\frac{1}{2}}\int_{-\infty}^{x}e^{-u^2/2}du, \qquad x<0,\ c_1>0;$$
$$=\tfrac{1}{2}+(2\pi)^{-\frac{1}{2}}\int_{0}^{x}e^{-u^2/2}du, \qquad x>0,\ c_2>0;$$

$$(4)\quad \Phi^4(x)=0, \qquad x\leqq -1;$$
$$=\tfrac{1}{2}, \qquad -1<x\leqq 1;$$
$$=1, \qquad x>1.$$

J. Wolfowitz (New York, N. Y.).

Source: Mathematical Reviews, 1950 Vol 11 No. 8

SMIRNOV, N. V.

PA 174T31

USSR/Mathematics - Chance Quantities 11 Sep 50

"Constructing the Confidence Region for a Density of Distribution of a Random Sample," N. V. Smirnov

"Dok Ak Nauk SSSR" Vol LXXIV, No 2, pp 189-191

Considers n independent observations of chance quantity X, distributed with continuous density f(x). Ordinary method of approximating unknown f(x) according to given selection on interval (a, b) is to construct "histogram" of frequencies $f_n^*(x)$. Submitted 14 Jul 50 by Acad A. N. Kolmogorov.

174T31

USSR/Mathematics - Statistics, Mathe- Jul/Aug 51
matical

"The Works of N. V. Smirnov on the Study of the Properties of Variational Series and on the Non-parametric Problems of Mathematical Statistics," A. N. Kolmogorov, A. Y. Khinchin

"Uspekh Matemat Nauk" Vol VI, No 4 (44), pp 190-192

Until recently in math statistics one was limited almost exclusively to problems of detg the parameters. For example, earlier it was assumed that the distribution function F(x) possesses the usual gaussian fc m and the usual parameters a

191T84

USSR/Mathematics - Statistics, Mathe- Jul/Aug 51
matical (Contd)

(shift) and sigma (spread) are evaluated from the observed quantities $x_1, x_2, .., x_n$. Often such an approach is artificial in problems. However, Smirnov considered all possible types of distribution functions and terms.

191T84

SMIRNOV, N. V.

SMIRNOV, N.V.

Method for the construction of confidence regions for a normal distribution function from sampling data. Trudy Inst.mat.i mekh. AN Uz.SSR no.10 pt.1:122-130 '52. (MLRA 8:9)
(Probabilities)

SMIRNOV, N. V.

Dunin-Barkovskii, I. V., i Smirnov, N. V. Teoriya veroyatnostei i matematičeskaya statistika v tehnike. Obščaya čast'. [The theory of probability and mathematical statistics in engineering. General part.] Gosudarstv. Izdat. Tehn.-Teor. Lit., Moscow, 1955. 556 pp. 25.85 rubles.

This book on probability and mathematical statistics is written for engineers and engineering students. Therefore only those parts of probability theory are discussed which are needed for the exposition of the methods of mathematical statistics, and more complicated proofs are frequently omitted. Chapter I (pp. 11–15) gives a brief historical survey which consists mostly of a listing of names and dates of prominent scientists working in the field. The role of the Russian School is strongly emphasized but the work of western statisticians is also briefly discussed (of contemporary scientists R. A. Fisher, J. Neyman and A. Wald are mentioned). In the authors' opinion the results of English and American mathematical statisticians are applied to further reactionary aims. However this view does not prevent the use and exposition of these results in the book. The student of the book will acquire a good working knowledge of statistical methods regardless of their origin.

Math 2

1/3

Domin-Barkovskiĭ, I. V. ...

Chap. II (pp. 16–50), "Basic concepts of probability theory", Ch. III (pp. 51–104), "Random variables and their characteristics", and Ch. IV (pp. 105–177), "Some special distributions", provide an introduction into probability theory which is adequate for the purpose of the book. Chap. V (pp. 178–291), "Sampling methods and statistical estimates of distributions", discusses briefly descriptive statistics and then gives an introduction into the mathematical methods of statistics. The topics discussed include: desirable properties of estimates, methods to obtain point estimates, interval estimation, order statistics. Chap. VI (pp. 292–363), "Testing of statistical hypotheses", contains the usual material but treats the analysis of variance only very briefly. Tests of goodness of fit (including Kolmogorov's test) as well as tests for randomness and tests for normality are discussed. The concept of the power function is introduced in the last paragraph of this chapter. Chap. VII (pp. 364–430), "Fundamentals of Correlation Theory", deals not only with measures of association, estimation problems and testing of hypotheses concerning correlation and regression coefficients but also with least-squares theory. Chap. VIII (pp. 431–490), "Some applications of statistical and probabilistic methods in engineering", treats some specific engineering applications, the precision

2/5

Donin-Barkovskiĭ, I. V. ...

of measurements and statistical quality control. The authors state here that the idea to apply statistical and probabilistic methods to problems of quality control occurs already in a paper (inaccessible to this reviewer) by M. V. Ostrogradskiĭ [Bull. Cl. Phys.-Math. Acad. Imp. Sci. St.-Pétersbourg 6 (1846), no. 21–22, 321–346 (1848)]. The Appendix (pp. 492–550) contains 30 statistical tables (with examples and references to the main body of the text) and a bibliography. The F-table has the misleading headings "degrees of freedom of greater (resp. smaller) mean square" which contradicts the description of the one-tailed test given in Chapter VI. The bibliography contains only books published in Russian and gives no references to the periodical literature. *E. Lukacs.*

3/3

SMIRNOV, N.V.

Smirnov, N. V. On the statistical estimation of transition probabilities in Markov chains. Vestnik Leningrad. Univ. 10 (1955), no. 11, 47–48. (Russian)

Let $\|p_{ij}\|$ be a stochastic matrix of order $s+1$ with strictly positive elements, and let (p_i) be the corresponding set of stationary absolute probabilities, with $p_ip_{ij}=p_jp_{ji}$. Let m_{ij} be the number of transitions from i to j in n trials. Then the probability of a specified matrix $\|m_{ij}\|$ is calculated, and this leads to a χ^2 test with s^2+s degrees of freedom that a specified stochastic matrix be the true one. *J. L. Doob* (Urbana, Ill.).

SMIRNOV, N.V., prof., otv.red.

[Tables of Student's distribution functions and densities] Tablitsy funktsii raspredeleniia i plotnostei raspredeleniia St'iudenta. Moskva, 1960. 121 p. (MIRA 13:11)

1. Akademiya nauk SSSR. Matematicheskiy institut.
(Mathematical statistics--Tables, etc.)

SMIRNOV, N.V., otv.red.; VOLKOVA, V.V., tekhn.red.

[Tables of the distribution function, the probability density function, and its normal derivatives] Tablitsy normal'nogo integrala veroiatnostei, normal'noi plotnosti i ee normirovannykh proizvodnykh. Moskva, 1960. 135 p. (MIRA 14:4)

1. Akademiya nauk SSSR. Matematicheskiy institut. 2. Chlen-korrespondent AN SSSR (for Smirnov).
(Distribution (Probability theory))

SMIRNOV, N.V.

PHASE I BOOK EXPLOITATION SOV/4931

Soveshchaniye po teorii veroyatnostey i matematicheskoy statistike, Yerevan, 1958

Trudy Vsesoyuznogo soveshchaniya po teorii veroyatnostey i matematicheskoy statistike, Yerevan, 19-25 sentyabrya 1958 g. (All-Union Conference on the Theory of Probability and Mathematical Statistics. Held in Yerevan 19-25 September, 1958. Transactions) Yerevan, Izd-vo AN ASSR, 1960. 291 p. Errata slip inserted. 2,500 copies printed.

Sponsoring Agency: Akademiya nauk Armyanskoy SSR.

Editorial Staff: G.A. Ambartsumyan, B.V. Gnedenko, Ye.B. Dynkin, Yu.V. Linnik and S. Kh. Tumanyan; Ed. of Publishing House: A.G. Sikuni; Tech. Ed.: M.A. Kaplanyan.

PURPOSE: The book is intended for mathematicians.

COVERAGE: The book contains 41 articles submitted to the Conference and dealing with the theory of probability and mathematical statistics. Some of the articles are the papers read at the Conference and edited for publication, while others outline the theses of papers which appeared or are scheduled to appear, wholly or in part, in other publications; in some cases, such publications are quoted. A list of the papers whose contents were published elsewhere is included and the places of publication are indicated. Individual articles examine theories of mass service, spectral instruments, numbers, games, and certain functions, and discuss the theorems of Shannon, Markov's chains, and certain processes, quantities, and functions. Such items as the method of least squares, the stochastic, Markov's and diffusion processes, measures and their applications, a scheme of Bernoulli experiments, Markov-type random fields, visible distribution of stars, Brownian motion, capacity of radio channels, and defective products are considered. No personalities are mentioned. References accompany some of the articles.

Card 6/8

25608
S/517/60/059/000 001/006
B112/B202

16.4600

AUTHORS: Bykhovskiy, E. B., Smirnov, N. V.

TITLE: Orthogonal decomposition of a space of vector functions quadratically summable over a given domain and of operators of the vector analysis

PERIODICAL: Akademiya nauk SSSR. Matematicheskiy institut. Trudy, v. 59, 1960, 5-36

TEXT: The authors study Hilbert spaces $L_2(\Omega)$ of vector functions $\vec{v}(x) = (v_1, v_2, v_3)$ whose domain of definition is a region Ω of the threedimensional Euclidean space E_3. The scalar product in $L_2(\ )$ is:

$$(u,v) = \int_{\Omega} \sum u_k v_k \, dx.$$

The authors consider a decomposition of $L_2(\Omega)$ into subspaces $\mathring{G}$, $\mathring{U}$ and $\mathring{J}$ orthogonal to each other which have been introduced by H. Weyl in a fundamental paper (The method of orthogonal projection in potential theory. Duke Math.

Card 1/3

Orthogonal decomposition of a ...

In §3 the equivalence of the decomposition of §1 to Weyl's decomposition is demonstrated; in §4 the authors study the projection onto the Weyl subspaces. The last chapter III contains the studies of chapter II extended to limited, multiply connected spaces. The last section gives aspects of further studies for unbounded domains Ω. O. A. Ladyzhenskaya, S. L. Sobolev, S. G. Kreyn and V. M. Babich are mentioned. There are 1 figure and 26 references: 25 Soviet-bloc and 1 non-Soviet-bloc.

X

Card 2/3

An analytical solution of ...

the order of changes on passing from the smooth to the disturbed region, is small. With the above assumptions the problem of flow is solved for one region by the method of linear approximations and recurrence relations are then derived which make it possible to find λ_x, λ_y and λ_z in any region between the airfoils. 3-dimensional equations of flow are

$$\begin{aligned}
&\left(\frac{1}{k}\lambda_x-\xi\lambda_z\right)\frac{\partial\lambda_x}{\partial\xi}+(\lambda_y-\eta\lambda_z)\frac{\partial\lambda_x}{\partial\eta}=-\frac{1}{k\omega}\frac{\partial\Pi}{\partial\xi},\\
&\left(\frac{1}{k}\lambda_x-\xi\lambda_z\right)\frac{\partial\lambda_y}{\partial\xi}+(\lambda_y-\eta\lambda_z)\frac{\partial\lambda_y}{\partial\eta}=-\frac{1}{\omega}\frac{\partial\Pi}{\partial\eta},\\
&\left(\frac{1}{k}\lambda_x-\xi\lambda_z\right)\frac{\partial\lambda_z}{\partial\xi}+(\lambda_y-\eta\lambda_z)\frac{\partial\lambda_z}{\partial\eta}=\frac{1}{\omega}\left(\xi\frac{\partial\Pi}{\partial\xi}+\eta\frac{\partial\Pi}{\partial\eta}\right),\\
&\frac{1}{k}\frac{\partial\omega\lambda_x}{\partial\xi}+\frac{\partial\omega\lambda_y}{\partial\eta}-\xi\frac{\partial\omega\lambda_z}{\partial\xi}-\eta\frac{\partial\omega\lambda_z}{\partial\eta}=0,\\
&\left(\frac{1}{k}\lambda_x-\xi\lambda_z\right)\frac{\partial}{\partial\xi}\left(\frac{\Pi}{\omega^2}\right)+(\lambda_y-\eta\lambda_z)\frac{\partial}{\partial\eta}\left(\frac{\Pi}{\omega^2}\right)=0.
\end{aligned}\qquad (5)$$

where

Card 2/ 6

An analytical solution of ...

$$\frac{d\Phi_2}{d\eta} = \frac{1}{\eta}\frac{d\Phi_1}{d\eta},$$
$$\frac{df_2}{d\sigma} = -\frac{1+\sigma^2}{2k\sigma}\frac{df_1}{d\sigma}, \qquad (31)$$
$$\frac{df_3}{d\sigma} = \frac{1-\sigma^2}{2\sigma}\frac{df_1}{d\sigma},$$
$$\frac{dF_2}{d\tau} = -\frac{1+\tau^2}{2k\tau}\frac{dF_1}{d\tau},$$
$$\frac{dF_3}{d\tau} = \frac{1-\tau^2}{2\tau}\frac{dF_1}{d\tau},$$

The equation of shock waves is obtained on assumption that if the equation of the characteristic is $\eta = \alpha\xi = \beta$, then the equation of the corresponding shock wave is

$$\eta = \alpha\xi + \beta + \varepsilon^{(1)}(\xi) \qquad (19)$$

where $\varepsilon^{(1)}(\xi)$ is small, and α and β are constants. It is

Card 4/6

zhMM

S/043/61/000/003/007/008
D201/D305

26 2111
10 1210

AUTHOR: Smirnov, N.V.

TITLE: Analytical solution to the problem of supersonic gas flow past a lattice of conical airfoils. II

PERIODICAL: Leningrad. Universitet. Vestnik. Seriya matematiki, mekhaniki i astronomii, no. 3, 1961, 146-156

TEXT: The problem was dealt with in the first approximation by the author in part I of this article (Ref. 1: Analiticheskoye resheniye zadachi ob obtekanii reshetki konicheskikh lopatok sverkhzvukovym potokom gaza. I. Vestnik Leningr. un-ta, 7, 105-116, 1961). The present article deals with the second approximation. The notations, results and assumptions of part I are widely used in the following. The aerodynamic parameters in the disturbed region are

$$\lambda_x = 1 + \lambda_x^{(1)} + \lambda_x^{(2)}, \quad \lambda_y = \lambda_y^{(1)} + \lambda_y^{(2)}; \quad \lambda_z = \lambda_z^{(1)} + \lambda_z^{(2)};$$

$$\Pi = \Pi_0 + \Pi^{(1)} + \Pi^{(2)}, \quad \rho = 1 + \rho^{(1)} + \rho^{(2)}, \qquad (1)$$

Card 1/4

through the point c_m, in the first approximation; p is the ordinate of c_m; $g^{(2)}(\xi)$ is a second-order quantity. There is no tangential discontinuity in the first approximation. Equations are set up which make it possible to determine the 3 arbitrary functions and to find (to an accuracy of second-order quantities) the equations for shock waves and tangential discontinuities. Recurrent formulas are given for the solutions $\lambda_y^{(2)}$, $\lambda_x^{(2)}$, $\lambda_z^{(2)}$ in the regions l_1 and l_2 of Fig. 1. It is assumed that the solutions are known in the regions m_1 and m_2; the solutions in m_3 and m_4 are obtained by continuation of the solutions in m_1 and m_2. The equation for the line of tangential discontinuity is found by a simple quadrature. The shock-wave equation reduces to the integration of a first-order differential equation. The tangential-discontinuity line which divides m_3 and m_4 is determined. It is concluded that in the second approximation, the continuation of aerodynamic parameters from one region into the next may lead to a series of new tangential discontinuities; but only those need be determined which originate at the points of intersection of shock waves; the others are direct-

APPROVED FOR RELEASE: 08/25/2000 CIA-RDP86-00513R001651530007-3"

S/043/61/000/003/007/008
Analytical solution... D201/D305

ly obtained from the continuation formulas. It is noted that the continuation process of the second approximation gives an incomplete picture of tangential discontinuities, whereas the first approximation did not reveal them at all. In addition, in the second approximation the tangential discontinuities terminate upon intersecting a tangential discontinuity which originates from the point of intersection of shock waves. There are 2 figures and 2 Soviet-bloc references.

Fig. 1. Legend: Diagram of division of inter-airfoil space by discontinuities

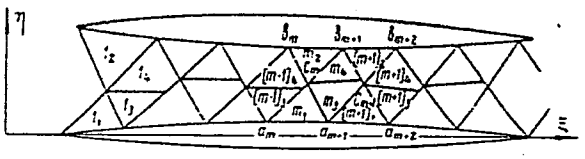


Рис. 1. Качественная схема разбиения межлопаточного пространства разрывами.

S/030/61/000/008/002/005
B105/B206

New fields of mathematical statistics

Akademiya nauk Litovskoy SSR (Academy of Sciences Litovskaya SSR) and Vil'nyusskiy universitet (Vil'nyus University), 26 of a total of 88 reports and communications dealt with problems connected with random processes of various types. This illustrates the great importance of this branch of science. In the period of 1930-1940 great progress was made by Soviet mathematicians in the field of nonparametric statistics. The theorem $D_n = S_{up}|F_n(x) - F(x)|$ by A. N. Kolmogorov is pointed out. This is an expression for the maximum deviation of the empirical function $F_n(x)$ from the theoretical distribution function $F(x)$. The latest studies by E. L. Lehmann, Z. U. Birnbaum, N. V. Smirnov, D. M. Chibisov, and others on nonparametric methods are mentioned. At present, nonparametric methods are being elaborated in detail, since a number of difficult new problems are to be settled by nonparametric statistics in connection with the theory of random processes. Many studies stimulated by the ever-increasing demands of physics and technology are conducted in this field. The possibility of applying statistical methods on an enlarged scientific basis is much promising. There are 5 references: 4 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as

Card 2/3

35968
S/517/61/064/000/004/006
D299/D301

16.6100

AUTHOR: Smirnov, N. V.

TITLE: Probabilities for large values of nonparametric one-sided fit-tests

SOURCE: Akademiya nauk SSSR. Matematicheskiy institut. Trudy. v. 64, 1961, 185-210

TEXT: Exact distribution laws are derived for the statistics D_n^+, $\bar{D}_n$, R_n^+ and $\bar{R}_n$; this is done without having recourse to integration. Correct estimates are obtained for the probability of large deviations of the empirical function $F_n(x)$ from the continuous distribution-function $F(x)$. First, 2 lemmas are proved. Lemma 1: The probability Q_s of regular distribution (in the system $\mathcal{E}$) of s points ($s \geqslant 2$) is:

Card 1/8

$$p_{ns} = \frac{\alpha}{(b-a)} \binom{n}{s} \left(\frac{\alpha+sd}{b-a}\right)^{s-1} \left(1 - \frac{\alpha+sd}{b-a}\right)^{n-s} \qquad (2.17)$$

From the 2 lemmas follow 2 corollaries, the first of which stating the inequalities which determine the break in the regular distribution, viz.:

$$x_{i+1} \leqslant a + \alpha + id \quad (i = 0, 1, \ldots, (s-1))$$

$$x_{s+1} > a + \alpha + sd \qquad (2.20)$$

The probability that (2.20) holds is expressed by formula (2.17). The second corollary states that the probability that at least one break in the regular distribution occurs, is

Probabilities for large ...

Further, $\bar{D}_n(\theta, 1)$ are considered: One obtains

$$P(D_n(\theta, 1) > \varepsilon) = \sum_{m=0}^{[n(\theta-\varepsilon)]} \binom{n}{m} \theta^m (1-\theta)^{n-m} + \frac{n!}{(m_1-1)!(n-m_1)!} \int_0^{\theta} x^{m_1-1} \sum_{p=0}^{p=m_2-m_1} \pi_{n-m_1, p}\left(\varepsilon + \frac{m_1}{n} - x,\ 1 - \frac{m_1}{n} - \varepsilon,\ \frac{1}{n}\right) dx; \tag{3.16}$$

where $m_1 = [n(\theta - \varepsilon)] + 1$, $m_2 = [n(1 - \varepsilon)]$. For Réniy statistics one obtains

$$P(\bar{R}_n(0, 1) > \varepsilon) = P(R_n^+(0, 1) > \varepsilon) = 1 - \frac{\varepsilon}{1+\varepsilon} \tag{4.8}$$

Card 5/ 8

Analogous results can be obtained for the statistics D_n^+ and D_n^-. For Réniy statistics, theasymptotic distribution (for $n \to \infty$, $z \to \infty$, $z = O(\sqrt{n})$, is expressed by:

$$P(R_n^+(\theta,1) > zn^{-1/2}) \approx \sqrt{\frac{2(1-\theta)}{\pi\theta}}\ \frac{\Psi_n(z,\tau)}{z} \qquad (8.6)$$

where

$$\tau = 1 - \theta - \frac{z\theta}{\sqrt{n}} \qquad (8.7)$$

There are 10 references: 6 Soviet-bloc and 4 non-Soviet-bloc (including 1 translation). The references to the English-language publications read as follows: Goro Ishii. Kolmogorov-Smirnov test in life-test. Ann. Inst. Statist. Math., 10, n. I, 37-46, 1958;

Card 7/8

SMIRNOV, Nikolay Vasil'yevich; BOL'SHEV, Login Nikolayevich; MEDER, V.M., red. izd-va; SIMKINA, G.S., tekhn. red.

[Tables for calculating the function of two-dimensional normal distribution]Tablitsy dlia vychisleniia funktsii dvumernogo normal'nogo raspredeleniia. Moskva, Izd-vo Akad. nauk SSSR, 1962. 203 p. (MIRA 15:9)

(Mathematical statistics)

On supersonic conical flows with ...

as compared to the oncoming flow; the aerodynamic elements in the disturbed region differ little from the corresponding elements in the oncoming flow. Linearization is effected and the first- and second approximation of the solution are considered. In the first approximation, one obtains

$$p' = 2\frac{\rho_1^2 E_{\rho_1} + \rho_1^2 v_{1n}^2 E_{p_1} - p_1}{1 - \rho_1^2 v_{1n}^2 E_{p_1 p_1} - \frac{\rho_1^2}{v_{1n}^2} E_{\rho_1\rho_1} - 2\rho_1^2 E_{p_1\rho_1} - 2\frac{\rho_1^2}{v_{1n}^2} E_{\rho_1}}. \quad (20)$$

$$v_x' = \frac{\alpha}{\beta} v_y', \quad v_z' = \frac{\alpha}{\gamma} v_y', \quad v_x' = -\frac{p'}{\rho_1 v_1}. \quad (21)$$

Formula (20) can be used for determining the position of the shock wave. In the second approximation, one obtains

$$\widetilde{p''E_{p_1}} + \left(E_{\rho_1} - \frac{p_1}{\rho_1^2}\right)\rho'' = \left(\frac{1}{2a_1^2\rho_1^2} - \frac{p_1}{a_1^4\rho_1^3} - \frac{1}{2}E_{p_1p_1} - \frac{1}{a_1^2}E_{p_1\rho_1} - \frac{1}{2a_1^4}E_{\rho_1\rho_1}\right)p'^2. \quad (27)$$

and a formula, analogous to Eq. (20). In view of the above results, it can be assumed that the problem of flow past a lattice of conical airfoils can be solved by the same method as for $E = \frac{1}{\kappa - 1}\frac{p}{\rho}$.

Card 2/3

SMIRNOV, N.V., inzh.

Evaluating the strength of concrete and reinforced concrete elements under compression. Transp.stroi. 14 no.12:44-45 D'64. (MIRA 19:1)

SMIRNOV, Nikolay Vasil'yevich; DUNIN-BARKOVSKIY, Igor' Valerianovich; LAPKO, A.F., red.

[Course in probability theory and mathematical statistics for technical applications] Kurs teorii veroiatnostei i matematicheskoi statistiki dlia tekhnicheskikh prilozhenii. Izd.2., ispr. i dop. Moskva, Nauka, 1965. 511 p. (MIRA 18:5)

POZDNYAKOV, Boris Pavlovich; KOTEL'NIKOVA, V.F., ml. nauchn. sotr.; SMIRNOV, N.V., prof. retsenzent; NESHATAYEVA, N.M., red.

[Sampling methods in spinning] Metody otbora prob v priadenii. Moskva, Legkaia industriia, 1965. 226 p. (MIRA 18:10)

1. Matematicheskiy institut AN SSSR (for Kotel'nikova).

ACC NR: AP6008918

were stored after a 4-day preliminary set and held at a temperature of 14--18C under a water spray for a 28-day period. A scheme for providing step increases in stress for the test specimens is discussed. During the tests measurements were made of the longitudinal deformations along the principal stress directions, and also of transverse deformations in the unloaded direction. The test results were contrasted with the hypothesis that the increase of strength observed in individual tests was due to the force of friction at the edge of the specimen. The stress distribution from normal and tangential edge forces on an element of a test specimen is plotted. Ultrasonic stress measurements were employed in the tests, and the measurements are tabulated. Data plots of transverse deformations are shown, as is a plot of the measured variation of the coefficient of transverse deformation for uniaxial and biaxial compression. Orig. art. has: 6 figures and 2 tables.

SUB CODE: 11/ SUBM DATE: none/ ORIG REF: 004/ OTH REF: 001

Card 2/2 egh

L 43141-66 EWT(d) IJP(c)
ACC NR: AP6013889 SOURCE CODE: UR/0020/66/167/006/1238/1241

AUTHOR: Smirnov, N. V. (Corresponding member AN SSSR); Sarmanov, O. V.; Zakharov, V. K.

ORG: Mathematics Institute im. V. A. Steklov, Academy of Sciences, SSSR (Matematicheskiy institut Akademii nauk SSSR)

TITLE: Local limit theorem for the number of transitions in a Markov chain and its application

SOURCE: AN SSSR. Doklady, v. 167, no. 6, 1966, 1238-1241

TOPIC TAGS: Markov process, transition probability

ABSTRACT: A simple homogeneous Markov chain with $s + 1$ states E_i, $i = 1, 2, \ldots, s + 1$ and a positive matrix of transition probabilities $\{P_{ij}\}$, $p_{ij} > 0$, $i, j = 1, 2, \ldots, s + 1$ is considered. It is assumed that the initial probability of E_i is $p_i^{(1)} > 0$. A chain consisting of s states among whose elements must be distributed in a definite way a series of states E_{s+1} is treated. It is noted that the expression for the number of different chains of length n consisting of $s + 1$ states reduced earlier by the same author (Vestn. LGU, No. 11, 47, 1955) is in error. It is pointed out that the assumption that P_{ij} be always positive is not necessary. Orig. art. has: 14 formulas.

SUB CODE: 12/ SUBM DATE: 08Dec65/ ORIG REF: 003/ OTH REF: 001
Card 1/1 MLP UDC: 519.217

L 09094-67

ACC NR: AP7002335

The use of an ordered sample for the solution of various statistical problems should rest on an investigation of the asymptotic behavior of the distributions of x_{kn}, given large n. The two parts to this problem were solved for the maximum and minimum terms by B. V. GNEDENKO and were considered for "central" terms by the author of the present article in 1949. However, for a long time there was no consideration of the case of the so-called "intermediate" terms of series (1):

$$\left.\begin{array}{l} k = k(n) \to \infty \quad (n \to \infty) \\ \dfrac{k(n)}{n} \to 0 \end{array}\right\} \qquad (2)$$

or analogously

$$\left.\begin{array}{l} n - k(n) \to \infty \\ \dfrac{n - k(n)}{n} \to 0 \end{array}\right\}.$$

In 1964 D. M. CHIBISOV found three possible types of limit distributions of x_{kn} for intermediate terms and established the regions of attraction of each. However, CHIBISOV's investigations assign an important role to an assumption defining the order of increase of k(n), together with n: viz., k(n) $\approx$

Card 2/3

L 3179-66 ETC(m) WW

ACCESSION NR: AP5015353 UR/0286/65/000/009/0098/0099

681.14

AUTHOR: Chekalov, D. N.; Mulyar, L. G.; Krasikov, V. I.; Miroshnichenko, A. K.; Smirnov, N. Ye.; Kheyfets, A. I.; Smirnov, K. F.; Obukhov, Yu. A.; Vorontsov, A. M.; D'yakonov, G. M.; Dubro, G. B.; Alipov, A. N.

TITLE: Electronic instrument for measuring velocity, distance traversed, and time. Class 42, No. 170776

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 9, 1965, 98-99

TOPIC TAGS: tellurometer, radio rangefinder, geodetic instrument

ABSTRACT: An Author Certificate, issued for a device which measures velocity, distance traversed, and time, combines a high-precision tellurometer, a phase recorder equipped with a unit for converting sinusoidal signals to pulsed signals, and a unit for measuring phase differences. Readings are made visually. The circuit connections of the device, consisting of a series of computer-type modules, are described in detail. [SP]

ASSOCIATION: none

Card 1/2

ROZHKOV, Mikhail Ivanovich, kandidat biologicheskikh nauk; SMIRNOV, Nikita Yefimovich; PRITYKINA, L.A., redaktor; CHEBYSHEVA, Ye.A., tekhnicheskiy redaktor

[Plants rich in vitamins] Vitaminnye rasteniia. Moskva, Pishchepromizdat, 1956. 196 p. (MIRA 9:10)
(Vitamins) (Botany, Medical)

3

L 54720-65
ACCESSION NR: AP5017987 UR/0286/64/000/022/0097/0097

AUTHOR: Berkman, I. L.; Katyukhin, B. P.; Rannev, A. V.; Rustanovich, A. V.; Smirnov, O. A.; Grushetskiy, Yu. L.; Zhukov, F. N.; Ovechkin, M. M. 10 B

TITLE: Accumulator-pump hydraulic drive. Class 84, No. 166609

SOURCE: Byulleten' izobreteniy i tovarnykh znakov, no. 22, 1964, 97

TOPIC TAGS: hydraulic equipment, pump, excavating machinery, civil engineering

Translation: This inventor's certificate introduces an accumulator-pump hydraulic drive for the rotating platform of an excavator with power recovery during braking. The device includes an actuating cylinder and an auxiliary storage cylinder, power pump, hydraulic motor, valve distributer, recovery and filling check valves. In order to assure the necessary pressure in the storage cylinder, to reduce the time for charging the force pump and to simplify the construction, the device includes a packing valve which keeps up the level in the hydraulic motor and controlled safety valves, one of which charges the force pump and the other a blocking valve for all positions of the distributer valve except the neutral position, thus limiting the pressure in the actuating cylinder during braking.

Card 1/2

L 54720-65
ACCESSION NR: AP5017987

ASSOCIATION: Vsesoyuznyy nauchno-issledovatelskiy institut stroitel'nogo i dorozhnogo mashinostroyeniya (All-Union Scientific Research Institute of Construction and Road Building Machinery)

SUBMITTED: 18Nov63	ENCL: 00	SUB CODE: IE, GO
NO REF SOV: 000	OTHER: 000	JPRS

Card 2/2

MIRNOV, G. G.

"Clinical observations of the progress of virulent process in paralytic myoglobinuria in horses", (CVS, Department of Pathology and Therapy of Internal Noncontagious Diseases of Agricultural Animals). Collected Works No. 14, of Leningrad Veterinary Institute USSR Ministry of Agriculture, P 80, Sel'khozgiz, 1954.

Q

USSR/Farm Animals. Horses.

Abs Jour: Ref Zhur-Biol., No 20, 1958, 92569.

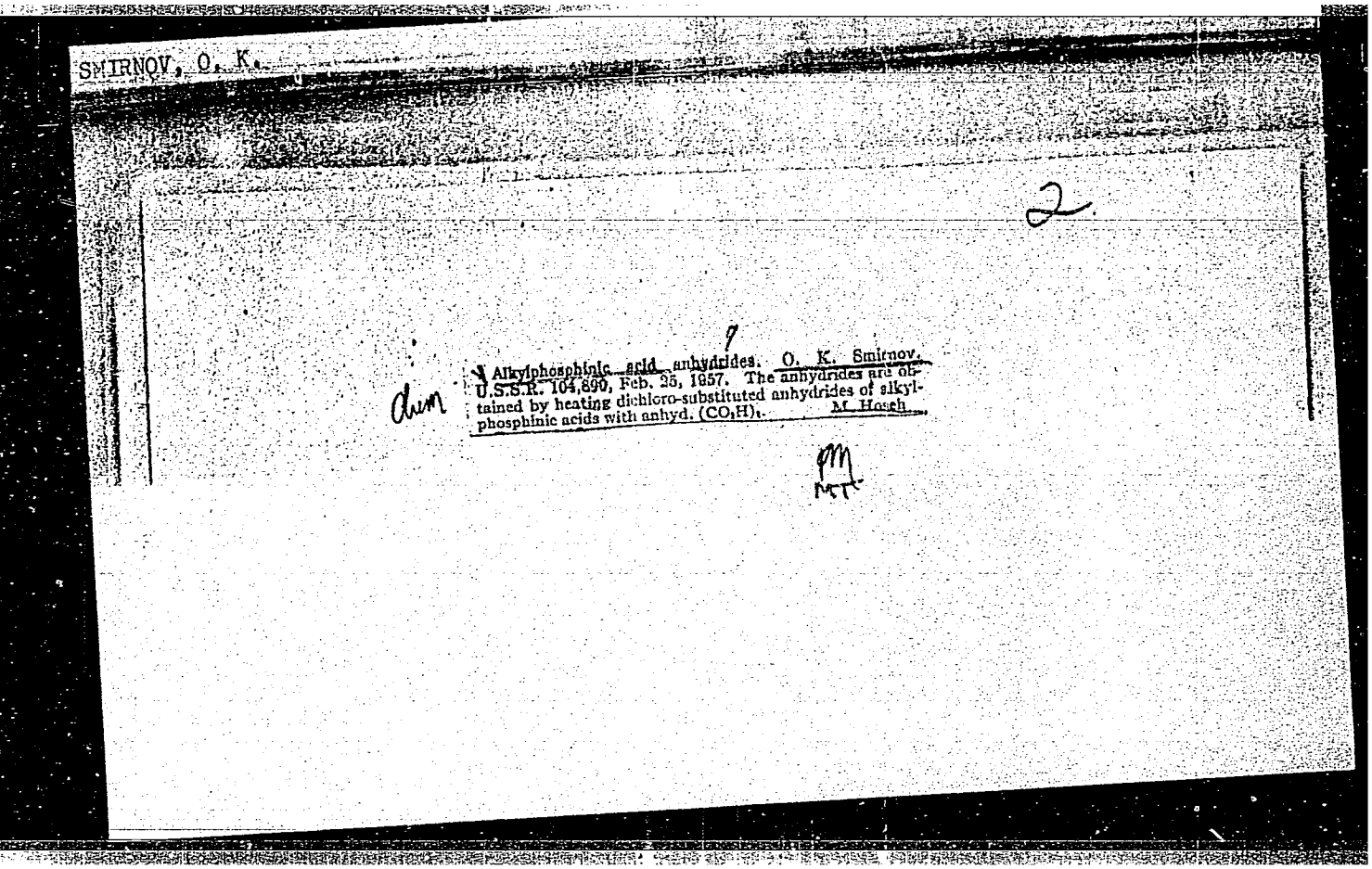
Author : Smirnov, O.K.
Inst : All-Union Horse Breeding Institute.
Title : Working Qualities of Priobskiy Horses and Their Crossbreeds.

Orig Pub: Byul. nauchno-tekhn. inform. Vses. n.-i. in-ta konevodstva, 1957, No 3, 44-47.

Abstract: Priobskiy horses and their crosses with trotters in Khanty-Mansiyskiy National Okrug showed excellent work capacity; they strode in 1 hour with a load up to 7 km and trotted up to 21 km. The trotter Priobskiy crosses of the I to IV generations turned out fine results, although they were inferior to the

Card : 1/2

SMIRNOV, O. K., Candidate of Agric Sci (diss) -- "The Ob' horse and methods of improving it". Leningrad-Pushkin, 1959. 17 pp (Min Agric USSR, Leningrad Agric Inst), 150 copies (KL, No 20, 1959, 114)



SMIRNOV, O. K.

2

Alkylphosphinic acid anhydrides. O. K. Smirnov. U.S.S.R. 104,890, Feb. 25, 1957. The anhydrides are obtained by heating dichloro-substituted anhydrides of alkylphosphinic acids with anhyd. $(CO_2H)_2$. M. Hosch

SMIRNOV, O K

5
1-4E2D

120.

Wetting agents for photographic emulsions. O. K. Smirnov, A. I. Rybnikova, S. M. Levi, and S. N. Kochneva. U.S.S.R. 105,337, Apr. 25, 1957. As wetting agents are used glycerides of alkenylsuccinic acid acylated at a temp. above 100° with 2 moles of alkenylsuccinic acid anhydride, and the resulting acid diester is neutralized with KOH. M. Hoseh

MT

SMIRNOV, O.K.

Polyglycerides of alkenylsuccinic acids. O. K. Smirnov, S. M. Levi, and A. I. Rybulkova. U.S.S.R. 105,345, April 25, 1957. Alkenylsuccinic anhydrides are esterified with glycerol. For the esterification is used a mixt. of polymers of butylene and amylene gases, b.70–220°, obtained in cracking and reforming petroleum. M. Hoseh

SMIENOV, O.K.

20

Photosensitive emulsion layers. S. M. Levi, O. K. Smirnov, K. G. Mizuch, and N. M. Kasatkin. U.S.S.R. 105,727, June 25, 1957. Water-sol. (hydroxymethyl)mel amine ethers of mono- or dibasic acs. are incorporated into a photosensitive emulsion in order to combine the tanning and plasticizing effects. M. Hoseh

5

SMIRNOV, O.K.

4

Increasing the mechanical strength of gelatin photographic layers. S. M. Levi, O. K. Smirnov, and O. V. Popova. U.S.S.R. 105,937, June 25, 1957. Water-sol. glycols with a chain of ≤4 C atoms or their ethers are added in a quantity ≥20 ml./l. of emulsion along with gelatin-tanning substances. This procedure increases the strength of the gelatin. M. Hosch

SMIRNOV, O.K.

Distr: 4E2c(j)/4E2d

15 20

✓ Protective coatings on movie films. L. V. Rozental', O. K. Smirnov, G. I. Burdygina, and Z. K. Averbukh. U.S.S.R. 165,132, Oct. 26, 1967. Protective coatings are made of cellulose acetylphthalate solns. in org. solvents, with or without a pigmenting substance, e.g., C black. To the above soln. or dispersion is added an aq. soln. of a weak base, e.g., NH_4OH, to neutralize partly the acid groups in the cellulose acetylphthalate, and then the requisite amt. of water is added.
M. Hoseh

B
2 May
2

Distr: 4E4J

/ Surface-active substances. O. K. Smirnov, S. M. Levi, and A. I. Rybnikova. U.S.S.R. 108,134, Oct. 25, 1957. An alkyl phosphinic acid anhydride (I), the alkyl radical of which contains ≧10-12 C atoms, is heated with the calcd. amt. of glycerol at ≧200° in the presence of catalytic amts. of KOH until the predetd. amt. of H_2O is split off and the resulting acid esters are neutralized. About 30–40 moles of glycerol is used per mole of I. The reaction can be carried out by use of 8 moles of glycerol per mole of I alkyl phosphinic acid anhydride, another mole of I being added to the resulting acid ester, and the whole being heated for 1 hr. at 150–70°, after which the resulting diether is neutralized.

M. Hoseh

SMIRNOV, O.K.

Distr: 4E4j/4E2d

Action of wetting agents in the emulsion-film base system in coating a photographic emulsion. S. M. Levi and O. K. Smirnov. *Uspekhi Nauch. Fot., Akad. Nauk S.S.S.R.; Otdel. Khim. Nauk* 5, 182–92(1957); cf. *Zhur. Nauch. i Prikład. Fot. i Kinematografii* 1, 354(1956).—The effectiveness of various types of wetting agents in eliminating "comets" during the process of coating film base with emulsion, and also their rates of adsorption were detd. Results are tabulated and graphed. Comets were eliminated by 0.001*M* concns. of Na butylnaphthalenesulfonate, the Na salt of the bis(2-ethylhexyl) ester of sulfosuccinic acid, the K salts of the monoglycerides of alkenylsuccinic acids where the alkenyl chains contained 8–16 C atoms, a complex ester of the "octaglyceride" of an alkenylsuccinic acid mixt. (alkenyl contained 8–10 C atoms), and the "octaglyceride" of an alkenylsuccinic acid (alkenyl contained 12–16 C atoms). Polyglycerides of alkenylsuccinic acids (0.001*M*) having the general formula $HOCH_2CH(OH)CH_2[OCH_2CH(OH)CH_2]_nO_2CCH_2CH(R)CO_2[CH_2CH(OH)CH_2O]_nCH_2CH(OH)CH_2OH$, where n is 3, 7, 11, 15, or 19 and R is alkenyl, eliminated comets when R contained 12–16 C atoms but not when R contained only 8–10 C atoms.

J. W. Loweberg, Jr.

SMIRNOV, O.K.; LEVI, S.M.; RYBNIKOVA, A.I.

The action of moisteners against "comets" in the coating of photographic emulsions. Part 1: The action of some derived alkenyl succinic acids against "comets." Zhur.nauch. i prikl. fot. i kin. 3 no.1:34-38 Ja-F '58. (MIRA 11:2)

1.Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley im. K. Ye. Voroshilova i Vsesoyuznyy nauchno-issledovatel'skiy kino-fotoinstitut.
(Photographic emulsions)

SOV/77-3-6-4/15

AUTHORS: Smirnov, O.K., Levi, S.M., Rybnikova, A.I., Kochneva, S.N.

TITLE: The Antistreak Effect of Wetting Agents in the Casting of Photographic Emulsions (Antikometnoye deystviye smachivateley pri polive fotograficheskikh emul'siy)
II. The Antistreak Effect of Certain Industrial Alkyl Phosphine Acids (Antikometnoye deystviye nekotorykh proizvodnykh alkilfosfinovykh kislot)

PERIODICAL: Zhurnal nauchnoy i prikladnoy fotografii i kinematografii, 1958, Vol 3, Nr 6, pp 416-418 (USSR)

ABSTRACT: The authors continue their investigation of the mechanism of the antistreak effect of surface-active substances during the casting of a photographic emulsion. A relation between the structure of certain commercial alkenyl succinic acids and their antistreak effect was established. The present article investigates dinatrium salts, mononatrium salts, monoglycerides and polyglycerides of alkyl phosphine acids. Results, with respect to the structure of the R radicals, antistreak effect, surface pressure of a 3% gelatin solution, and the critical speed of the wetting effect in cm/sec are discussed and tabulated (Table 1).

Card 1/2

SOV/77-3-6-4/15

The Antistreak Effect of Wetting Agents in the Casting of Photographic Emulsions.
II. The Antistreak Effect of Certain Industrial Alkyl Phosphine Acids.

The anti-streak properties of wetting agents of derivatives of alkyl phosphine acids confirm the conclusions drawn with respect to experimental results with derivatives of alkenyl succinic acids. The antistreak properties of the wetting agents are determined by their structure. A systematic interrelation between antistreak properties, surface pressure and kinetic wetting could not be established.
There is 1 table and 9 references, 7 of which are Soviet, 1 American and 1 German.

ASSOCIATION: Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (The All-Union Scientific Research Institute for Motion Pictures and Photography)

SUBMITTED: November 10, 1956

Card 2/2

AUTHORS: Levi, S.M., Smirnov, O.K. 69-58-2 -9/23

TITLE: The Effect of the Structure of Some Surface Active Substances on the Foaming Capacity of Aqueous Gelatine Solutions (Vliyaniye stroyeniya nekotorykh poverkhnostno-aktivnykh veshchestv na penoobrazovaniye vodnykh rastvorov zhelatiny)

PERIODICAL: Kolloidnyy zhurnal, 1958, Vol XX, Nr 2, pp 179-183 (USSR)

ABSTRACT: The formation of resistant foams and emulsions takes place in the presence of surface active substances which are adsorbed on the interface of the phases. The principal stabilizing factor which ensures the resistance of the foams is the optimum of the structural-mechanical properties of the surface layers in the disperse medium. Some of the derivatives of the alkylphosphinic and alkenylsuccinic acids were taken in order to investigate the dependence of the foaming capacity on the structure of these surface active substances in aqueous gelatine solutions. It has been shown, that the salts of the two acids, as well as monoglycerides, increase the foaming capacity if the length of their hydrophobic part is increased. If the length of the radical is less than C_8, foams are destroyed by these substances. The same property is present in acid esters of the alkylphosphinic acids and in monoatomic alcohols. The following

Card 1/2

69-58-2 -9/23

The Effect of the Structure of Some Surface Active Substances on the Foaming Capacity of Aqueous Gelatine Solutions

range has been established: acid esters of monoatomic alcohols (do not give foams) → disodium salts (do not give foams when R≤ C_8 ÷ C_{10}) → acid esters of glycerine (do not give foams when R≤ C_8 and m = 1) → polyglycerides (foaming agents). R being the hydrocarbon radical and m the number of moles of glycerine.
There are 6 tables and 16 references, 11 of which are Soviet, 3 German, 1 French, and 1 English.

ASSOCIATION: Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley, Moskva (Scientific Research Institute of Organic Intermediate Products and Dyes, Moscow)

SUBMITTED: January 15, 1957

1. Gelatine--Solutions--Surface structure--Analysis 2. Gelatine --Solutions--Foaming--Effectiveness

Card 2/2

DERYAGIN, Boris Vladimirovich; LEVI, Sergey Maksimovich. Prinimali uchastiye: SMIRNOV, O.K.; SHOR, M.I., glavnyy inzh.. BANKVITSER, A.L., red. izd-va; GUSEVA, I.I., tekhn.red.

[Physical chemistry of the deposition of thin layers on a moving base] Fiziko-khimiia naneseniia tonkikh sloev na dvizhushchu-iusia podlozhku. Moskva, Izd-vo Akad.nauk SSSR, 1959. 207 p. (MIRA 12:9)

1. Chlen-korrespondent AN SSSR (for Deryagin). 2. Fabrika foto-bumag No.4 (for Shor).
(Photographic emulsions) (Films (Chemistry))

SOV/69-21-3-13/25

5(4)

AUTHORS: Levi, S.M. and Smirnov, O.K.

TITLE: The Relation Between the Structure of Surface Active Substances and Their Adsorption Properties

PERIODICAL: Kolloidnyy zhurnal, 1959, Vol XXI, Nr 3, pp 315-321 (USSR)

ABSTRACT: This is a study of the relations between the structure of surface active agents and its effect on 1) the reduction of the surface energy of aqueous and gelatin solutions, 2) the kinetic wetting capacity of the surface active agents, 3) their emulsifying capacities, and 4) the foaming of gelating solutions. The experiments have shown that the maximum emulsifying and foam forming effect in gelatin solutions can be obtained with 1) alkenylsuccinic acid derivatives with an alkenyl chain length of 12 to 16 carbon atoms, provided there are ionogenic groups, and 2) polyglycerides of alkylphosphinic acids with a chain length of more than 20 glycerine molecules. The critical velocity

Card 1/3

SOV/69-21-3-13/25

The Relation Between the Structure of Surface Active Substances and Their Adsorption Properties

of kinetic wetting (see specification on page 315 and diagrams 1 and 2) increases with the growth of the molecular weight of the compound to a certain maximum value, which remains within the limits of one homologous series. The highest maximum value could be observed with polyglycerides. The authors further stated that linear growing of the alkyl radical chain of surface active compounds, which are components of aqueous and gelatin solutions, involves reduction of the surface tension. The authors express their gratitude for the aid of the Soviet scientists: Corresponding Member of the AS USSR B.V. Deryagin, Academician P.A. Rebinder and Professor A.B. Taubman. There are 2 diagrams, 1 graph, 5 tables and 21 references, 16 of which are Soviet, 3 English, 1 French and 1 German.

Card 2/3

SOV/69-21-3-13/25

The Relation Between the Structure of Surface Active Substances and Their Adsorption Properties

ASSOCIATION: Nauchno-issledovatel'skiy kinofotoinstitut, Moskva (Cinema Photograph Scientific Research Institute, Moscow)

SUBMITTED: 30 December, 1957

Card 3/3

SMIRNOV, O.K.; LEVI, S.M.; RYBNIKOVA, A.I.; Prinimali uchastiye: GRINEVA, N.I.; STEPANOVA, T.K.; KOCHNEVA, S.N.

Investigation of the wetting properties of some derivatives of alkenyl succinic acids. Org. poluprod. i kras. no.2:168-178 '61. (MIRA 14:11)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley (for Grineva). 2. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (for Stepanova, Kocheva).
(Succinic acid) (Wetting agents)

LEVI, S.M.; SMIRNOV, O.K.

Anticomet effect and structure of wetting agents. Part 4: Mechanism of the anticomet effect of surface active agents during the coating by pouring of photographic emulsions. Zhur. nauch. i prikl. fot.i kin. 6 no.1:34-38 Ja-F '61. (MIRA 14:3)

1. Vsesoyuznyy nauchno-issledovatel'skiy kino-fotoinstitut (NIKFI).
(Surface active agents) (Photographic emulsions)

KALINKINA (fnu), MYLTSEVA, V. A., SMIRNOV, [O.K.] and UVAROVA, V. M.

"Improvement of the properties of nuclear track emulsions through introducing surface active substances of the homologous series of sodium salts of the sulpho-succinic acid esters"

Fourth International Colloquium on Photography (Corpuscular) - Munich, West Germany, 3-8 Sep 62

LEVI, S.M.; SMIRNOV, O.K.

Investigation in the field of the application of wetting agents in the coating of films with photographic emulsions. Trudy NIKFI no.51:20-38 '62.

Hardening properties of compounds containing methylol (N-hydroxymethyl) groups. Ibid.:80-94 (MIRA 16:12)

L 8540-65 EWT(1)/T/EED(b)-3 Pae-2 IJP(c)/ESD(gs)/ESD(t)/RAEM(t)
ACCESSION NR: AR4044043 S/0058/63/000/011/D104/D104

SOURCE: Ref. zh. Fizika, Abs. 11D883

AUTHOR: Levi, S. M.; Smirnov, O. K.

TITLE: The tanning properties of compounds containing methylol (N-hydroxymethyl) groups

CITED SOURCE: Tr. Vses. n.-i. kinofotoin-ta, vy*p. 51, 1962, 80-94

TOPIC TAGS: tanning, photographic emulsion, tanning agent, methylol group, N-hydroxymethyl, diffusion tanning

TRANSLATION: Investigates the influence, on the physicomechanical properties of an emulsion layer, of a number of compounds containing the N-hydroxymethyl group. It is established that the test substances have tanning properties, but the results obtained from tanning with them differ from those obtained when tanning using formaldehyde. On introduction of tanning agents directly into the emulsion there is noted their negative influence on its photographic proper-

Card 1/2

L 8540-65
ACCESSION NR: AR4044043

ties. During diffusion tanning this influence is not noticed. Of practical interest are water-soluble ethers of hexymethylolmelanin and hydroxyethyloxosolidin; the former have both tanning and plasticizing effect and can be used in the hydrotype process for tanning of unexposed film.

SUB CODE: ES, OC ENCL: 00

Card 2/2

LEVI, S.M.; SMIRNOV, O.K.; IVANCHIKOVA, A.F.; KOCHNEVA, S.N.

Comet preventing action of wetting agents in the coating of photographic emulsions. Part 5. Comet preventing action of acid esters of the sulfosuccinic acid and their effect on the kinetic wetting. Zhur.nauch. i prikl. fot. i kin. 8 no.2:87-91 Mr-Ap '63. (MIRA 16:3)

1. Nauchnyy institut organicheskikh poluproduktov i krasiteley (NIOPiK) i Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (NIKFI).
(Photographic emulsions) (Wetting agents) (Succinic acid)

SMIRNOV, O.K.; LEVI, S.M.; DEMINA, S.G.; KOCHNEVA, S.N.

Some surface-active derivatives of isohexadecenylsuccinic acids. Zhur. nauch. i prikl. fot. i kin. 8 no.3:165-166 My-Je '63. (MIRA 16:6)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktor i krasiteley (NIOPiK) i Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (NIKFI).
(Succinic acid)
(Photographic emulsions)

SMIRNOV, O.K.; LEVI, S.M.; AVERBAKH, K.O.; KOCHNEVA, S.N.

Anticomet effect of the wetting agents produced during the coating of photographic emulsions. Report No.4: Anticomet effect of the esters of β-sulfopropionic acid and their effect on the kinetic wetting. Zhur.nauch. i prikl.fot. i kin. 8 no. 5:321-326 S-O '63. (MIRA 16:9)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley (NIOPiK) i Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (NIKFI).

SMIRNOV, O.S.

Reaction of anhydrous oxalic acid with alkylphosphinyl dichlorides. Zhur.prikl.khim. 38 no.6:1409-1412 Je '65. (MIRA 18:10)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley.

L 08458-67 EWT(m)/EWP(j) RM

ACC NR: AP6030902 (A,N) SOURCE CODE: UR/0080/66/039/008/1837/1844

27
B

AUTHOR: Zolin, V. M.; Rozental', L. V.; Smirnov, O. K.

ORG: none

TITLE: Plasticization of cellulose triacetate films by substituted esters of orthosilicic acid

SOURCE: Zhurnal prikladnoy khimii, v. 39, no. 8, 1966, 1837-1844

TOPIC TAGS: plasticizer, cellulose plastic, organosilicon compound

ABSTRACT: The purpose of the study was to find substituted esters of orthosilic acid (OSA) having both a high resistance to hydrolysis and a satisfactory compatibility with cellulose triacetate, in order to obtain plasticizers for cellulose triacetate films. Monosubstituted esters of OSA containing various groups forming the -Si-C- bond as well as alkoxyl groups of various lengths and structures of hydrocarbon radicals were synthesized. The main factor determining the hydrolytic stability of the esters was found to be the size and structure of the hydrocarbon radical of the alkoxyl group. The compatibility of the substituted esters with partially saponified cellulose triacetate depends on both the length and structure of the alkoxyl radicals and on the structure of the radicals linked directly to the silicon atom. Some of the synthesized substituted esters of OSA effectively lower the brittleness of films from

Card 1/2 UDC: 66.063.72

SMIRNOV, O. K.

Dec 43

USSR/Chemistry-Amines

"Analysis of High-Molecular Amines of the Aliphatic Series," R. I. Grayevskaya, O. K. Smirnov, Sci Res Inst of Org Intermediate Products and Dyes, 3½ pp

"Zavod Lab" Vol XIV, No 12

Explains disadvantages of existing method of amine analysis. Describes own modification. Apparatus used is practically same as that required for Van-Slayk method.

PA 49/49T20

SMIRNOV, O.K.

Smirnov, O.K. --"Investigation in the Field of 5-ethyl Nonane Derivatives." Cand Chem Sci, All-Union Sci ues Inst of Synthetic and Natural Essential Oils, Moscow 1953. (REFERATIVNYY ZHURNAL--KHIMIYA, No 1, Jan 54.)

Source: SUM 168, 22 July 1954

SMIRNOV,O.K.; BEZHENTSEVA,V.M.

Determination of the iodine (Wijs) number in mixtures of saturated and unsaturated amines produced from stearic acid. Zav. lab. 21 no.4:414 '55 (MLRA 8:6)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley.
(Stearic acid)(Amines)

O. K. Smirnov

4
1

Distr: [E4j]
7

γ-Butyrolactone and its derivatives. II. Some reactions of acyl derivatives of butyrolactone. F. N. Stepanov and O. K. Smirnov (Sci.-Research Inst. Org. Intermediates and Dye, Moscow). *Zhur. Obshchei Khim.* 27, 1042–4(1957); cf. *C.A.* 51, 7344*a*.—To 2.3 g. Na suspended in C_6H_6 was added at once 12.8 g. AcCH.CH_2.CH_2.O.CO and 10 drops MeOH and the mixt. shaken 4 hrs., warmed until all Na had dissolved, treated with 17 g. MeI, and refluxed 3 hrs. yielding after aq. treatment 75% *AcMeC.CH₂.CH₂.O.CO*, b_{13} 125–6°, d_{20} 1.1464, n_D^{20} 1.4581; *semicarbazone*, m. 190°. The oxo lactone refluxed 0.5 hr. with 5% HCl, cooled, and satd. with K_2CO_3 gave 93% *AcCHMeCH₂CH₂OH*, b_9 89°, d_{20} 0.9811, n_D^{20} 1.4405. The Na deriv. prepd. as above from 6 g. Na and 32 g. acetobutyrolactone was refluxed 1.5 hrs. with BuEtCHCOCl (40.5 g.) yielding *BuEtCHCO-CAc.CH₂.CH₂.O.CO*, b_4 155–6°, n_D^{20} 1.4737, which treated with MeONa in MeOH-C_6H_6 gave acetobutyrolactone and

1/2

88% $BuEtCHCO_2Me$. Treatment of 70 g. acetobutyrolactone with 93 g. p-$O_2NC_6H_4COCl$ in aq. Me_2CO with addn. of 20 g. NaOH at 10–15° at pH 8–9 followed by sepn. of the ppt., washing it with MeOH, and adding 100 ml. 15% NH_4OH and stirring 12 hrs. gave an orange ppt. which was washed with MeOH and stirred with 1 l. H_2O at 0° and treated with 100 ml. 25% NaOH yielding a residue of 36 g. p-$O_2NC_6H_4CONH_2$, while the filtrate on acidification gave 12% yellow p-$O_2NC_6H_4CO\overline{CH.CH_2.CH_2.O.CO}$, m. 119–20°. The Na deriv. from 25.6 g. acetobutyrolactone and 4.6 g. Na in C_6H_6 was treated with 36 g. $BrCH_2CH_2CH_2COCl$, refluxed 1 hr., treated with H_2O, the sepd. org. layer freed of volatile materials *in vacuo*, refluxed 2 hrs. with 3 g. Na in 50 ml. MeOH, and treated with H_2O gave 16% $\overline{CH_2.CH_2.O.CO.C}:\overline{C.CH_2.CH_2.CH_2.O}$, m. 86–7°, $b_{0.5}$ 120–30° [cf. Fittig, *et al.*, *Ann.* 257, 192, 200(1892)].

G. M. Kosolapoff

MARTYNOVA, O.I.; SAMOYLOV, Yu.F.; SMIRNOV, O.K.; CHEKHOVSKAYA, S.D.

Dissociation of calcium chloride in the process of generation of water vapor at high temperature and pressure. Zhur.neorg. khim. 5 no.1:16-22 Ja '60. (MIRA 13:5)
(Calcium chloride) (Water vapor)

SMIRNOV, O.K.; GRINEVA, N.I.

Conjugated oxidation of phosphorus trichloride and mixtures of aliphatic hydrocarbons. Neftekhimiia 2 no.2:237-241 Mr-Ap '62. (MIRA 15:6)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley.
(Hydrocarbons) (Oxidation) (Phosphorus chlorides)

SMIRNOV, O.K.; RYBNIKOVA, A.I.

Alkylation of maleic anhydride by a mixture of butylene trimers and tetramers. Neftekhimiia 2 no.3:342-347 My-Je '62.
(MIRA 15:8)

1. Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley.

(Maleic anhydride) (Butene)

S/080/62/035/011/007/011
D287/D307

AUTHORS: Rozental', L.V., Zhurnina, F.G., and Smirnov, O.K.

TITLE: The plasticizing effect of compounds which act as solvents for cellulose triacetate

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 11, 1962, 2512 - 2520

TEXT: The solvent action of phenylethyl phenols and of some of their derivatives (esters of fatty acids and fatty alcohols) was studied. Films of partially saponified cellulose triacetate, containing approximately 60 % bound acetic acid and having an average degree of polymerization of 350 were used during the experiments. The phenylethyl phenols were prepared by condensing phenol and styrene in the presence or absence of H_2SO_4 in toluene. A mixture of o-and p-isomers as well as the di-dubstituted compound 2,4 - di (α-phenylethyl phenol) were obtained during both methods of synthesis. The isomers were separated by repeated rectification and crystallization of the p-isomer. It was found that compounds containing an

Card 1/2

The plasticizing effect of ...

unsubstituted hydroxy group in the phenyl nucleus acted as solvents for cellulose triacetate. The plasticizing effect of compounds which have a low degree of compatibility is greater than that of plasticizers soluble in cellulose triacetate; this is improved by reduced brittleness of the film, especially at low temperatures (at -60°C). The authors suggest that plasticizing compounds with different degrees of compatibility with cellulose triacetate as well as discrepancies between the specific weight of the films account for the above phenomenon. The slight effect of plasticizers (which are completely compatible with cellulose triacetate) at low temperatures is also due to the strong interactions between the hydroxyl groups of the partly saponified cellulose triacetate and the polar groups of the plasticizer, i.e. the hydroxy groups of the phenylethyl phenols. There are 6 tables.

SUBMITTED: June 2, 1961

SMIRNOV, O.K.; LEVI, S.M.; RYBNIKOVA, A.I.; KORNEVA, E.D.; POPOVA, O.V.

Hardening and plasticizing effect of water-soluble ethers of hexamethylol melamine and some mono-, di- and triatomic alcohols and polyglycerins. Part 1: Ethers of hexamethylol-melamine and of mono-, di-, and triatomic alcohols and polyglycerins. Zhur. nauch. i prikl. fot. i kin. 8 no.6:401-404 N-D '63. (MIRA 17:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy kinofotoinstitut (NIKFI) i Nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley (NIOPiK).

MALYSHEV, A.I.; SMIRNOV, O.K.

Analysis of the surface-active derivatives of alkenylsuccinic acid by titration in a nonaqueous medium. Zav. lab. 29 no.10: 1173-1174 '63. (MIRA 16:12)

1. Gosudarstvennyy nauchno-issledovatel'skiy institut organicheskikh poluproduktov i krasiteley.

ACCESSION NR: AP4026854 S/0065/64/000/004/0066/0069

AUTHOR: Averbakh, K.O.; Shor, G. S.; Smirnov, O. K.; Gol'din, G. S.

TITLE: Methods of preventing the formation of ice crystals in fuels

SOURCE: Khimiya i tekhnologiya topliv i masel, no. 4, 1964, 66-69

TOPIC TAGS: Fuel, hydrocarbon fuel, ice formation, ice crystal formation, prevention, mechanical water removal, additive, ice prevention additive, surface active agents, review, literature survey.

ABSTRACT: This is a literature survey relating to the behavior of water in hydrocarbon fuels at low temperatures and to methods of preventing crystalization in them. The solubility of water in the hydrocarbon fuels at different temperatures, the transfer of water molecules between the fuel and air, formation of microdroplets of water on cooling, and conditions for the formation of ice crystals are included. Various physical and mechanical means of preventing or removing ice have not proven too successful. Two types of additives have helped solve the problem. The addition of 0.1-3% of materials which dissolve water and which are dissolved in hydrocarbons at low temperatures, e.g., certain alcohols, glycols or ethers, increases the solubility of water in the hydrocarbon fuel. The use of

Card 1/2

STYRIKOVICH, M.A.; SEROV, Ye.P.; SMIRNOV, O.K. PULELA KAMESVARA SARMA.

Use of the "salt method" in studying the characteristics of mass and heat reansfer. Dokl. AN SSSR 157 no.1:91-94 Jl '64
(MIRA 17:8)

1. Chlen-korrespondent AN SSSR (for Styrikovich).

STIRIKOVICH, M.A. (Moskva); SEROV, Ye.F. (Moskva); SMIRNOV, O.K. (Moskva); SAKMA, P.K. (Moskva)

Some characteristics of heat and mass transfer in steam generating pipes. Izv. AN SSSR. Energ. i transp. no.5:620-625 S-O '64. (MIRA 17:12)

SEROV, Ye.P., kand. tekhn. nauk; SMIRNOV, O.K., kand. tekhn. nauk; ZYKOV, L.A., inzh., dissertant

Experimental study of the boundary of the stability of a flow in parallel connected steam generating pipes with nonuniform heating of the surface. Teploenergetika 11 no.10:70-72 O '64. (MIRA 18:3)

1. Moskovskiy energeticheskiy institut.

ACC NR: AP6037029 SOURCE CODE: UR/0069/66/028/006/0777/0780

AUTHOR: Averbakh, K. O. (Moscow); Gol'din, G. S. (Moscow); Deryagin, B. V. (Moscow); Smirnov, O. K. (Moscow)

ORG: none

TITLE: Formation of hydrosol in hydrocarbon media at low temperatures

SOURCE: Kolloidnyy zhurnal, v. 28, no. 6, 1966, 777-780

TOPIC TAGS: hydrosol particle, hydrosol in toluene, hydrosol formation, toluene, hydrocarbon

ABSTRACT: A study has been made of the formation kinetics of hydrosol particles in toluene by ultramicroscopy. The equipment and procedure are described in the text. The effects of the time of the appearance of hydrosol nuclei, and of the water content and temperature of toluene on the formation of the aqueous phase were investigated. The experiments were conducted with toluene containing 0.014—0.024% water. It was shown that at -5 to -8C the particle concentration first increases rapidly with time, and then more slowly as the water content of the toluene drops; the rate of formation of hydrosol particles increases with the water content of the toluene. Experiments conducted in a wide temperature range indicated that the rate of formation of hydrosol particles increases with dropping temperatures. Orig. art. has: 4 figures.

SUB CODE: 21/ SUBM DATE: 11May66/ ORIG REF: 011/ OTH REF: 002/ ATD PRESS: 5107

UDC: 541.18.054

Card 1/1

SOV/96-59-2-9/18

AUTHORS: Samoylov, Yu.F., Candidate of Technical Sciences
Smirnov, O.K., Engineer

TITLE: The Behaviour of Calcium Hydroxide and Calcium Chloride in the Circuit of a Once-Through Boiler (Povedeniye gidrookisi i khlorida kal'tsiya v trakte pryamotochnogo kotla)

PERIODICAL: Teploenergetika, 1959, Nr 2, pp 53-57 (USSR)

ABSTRACT: A special test rig was set up to study the solubility of calcium compounds in steam and their behaviour during steam raising in conditions of once-through boilers. The test rig is illustrated diagrammatically in Fig 1 and described; the most important part of it is a steam-raising tube of 10/15 mm diameter (6/10 mm in the superheat zone) that imitates the operation of a coil in a once-through boiler. Feed water is pumped into one end of the tube and the steam coming out of the other is condensed. The heating arrangements, the measuring instruments and the test procedure are described. After operation the rig was cleaned out, one zone at a time, using pure distillate or in some cases acid. The tests

Card 1/5

The Behaviour of Calcium Hydroxide and Calcium Chloride in the Circuit of a Once-Through Boiler

discussed. A curve of the calcium ion content in the steam as a function of temperature when the rig is fed with a solution of calcium chloride at a pressure of 150 atm is given in Fig 3. It is suggested that at the lower temperatures the calcium chloride is decomposed to form calcium hydroxide and at the higher temperatures above 470°C calcium oxide is formed. In order to evaluate the accuracy of the results table 2 gives values of possible errors in determination of the concentration of calcium ions in samples of condensate. In the tests when the rig was fed with calcium chloride solution the steam condensate was always acidic which points to the presence of free hydrochloric acid, whilst the deposits were alkaline and so contained some form of calcium oxide. At high temperature, calcium chloride is slightly hydrolised even in aqueous solutions but the process is much more intense when boiling occurs and the volatile hydrochloric acid is removed with the steam. The ratio between concentrations of calcium and chloride

The Behaviour of Calcium Hydroxide and Calcium Chloride in the Circuit of a Once-Through Boiler

ions in the deposits in the tube was variable and depended on the concentration of calcium chloride in the feed water. Graphs of the contents of calcium and chloride ions in the steam as a function of temperature are given in Fig 4 and 5 respectively. Within the limits of experimental error the carry over of calcium ions in the superheated steam does not depend on the concentration of calcium chloride in the feed water but the concentration of chlorine ions in the steam does depend on this concentration and this confirms the author's ideas about hydrolysis. Previously published data about the solubility of calcium chloride obtained by the radio-active isotope method in an autoclave are given in Fig 4. Comparison of these results with those obtained in the rig of the Moscow Power Institute shows that carry-over of calcium ions is governed by the solubility of calcium chloride and possibly also by the solubility of the hydrolysis products of calcium chloride at temperatures up to 470°C. At higher

The Behaviour of Calcium Hydroxide and Calcium Chloride in the Circuit of a Once-Through Boiler

temperatures the carry-over is considerably less than the solubility determined in the autoclave and this is probably because of different hydrolysis conditions in the autoclave and test rig. There are 5 figures, 2 tables and 5 references of which 3 are Soviet and 2 German.

ASSOCIATION: Moskovskiy Energeticheskiy Institut (Moscow Power Institute)

SOV/96-59-8-10/27

AUTHORS: Styrikovich M.A. Corresponding Member Academy of Sciences USSR, Serov, Ye.P. Candidate of Technical Sciences, Smirnov, O.K., Engineer

TITLE: The Influence of Displacing the Transition Zone in Once-Through Boilers for Super-Critical Pressure

PERIODICAL: Teploenergetika 1959, Nr 8, pp 33-37 (USSR)

ABSTRACT: Displacement of the transition zone into the convective part of the furnace in order to increase the period between boiler washing was first tried on the fourth once-through boiler type 24-SP-200/140 to be installed. In the three preceding types of boiler the transition zone was not displaced. It has been observed that displacement is accompanied by more intense scaling at the end of the evaporation zone and in the first stages of super-heat. It should be noted that the experimental data that served as a basis for displacement of the transition zone were obtained on an experimental once-through boiler fed with water having a relatively high concentration of non-volatile contaminants. Then the results of displacing the zone were mainly checked

Card 1/5

on industrial medium-pressure boilers fed with water of a quality that would now be considered poor. Displacement can only be effective if scaling is concentrated in a particular part of the boiler; and if the scaling is distributed over a considerable range of increase in enthalpy of the steam, a transition zone entirely in the convective part of the furnace is scarcely feasible. This is particularly the case in unit-type sets whose feed-water temperature is reduced at partial load so that the boundary between evaporation and super-heating surfaces is displaced. The presence of various impurities in the feed water, and their solubility under different conditions, are then considered. A typical curve of the solubility of calcium sulphate in superheated steam as a function of temperature at constant pressure is given in Fig 1. Most substances behave in this way under super-critical conditions, that is, there is a temperature region of minimum solubility. In calculating the density of scaling by a substance from solution, it suffices to know the functional

The Influence of Displacing the Transition Zone in Once-Through Boilers for Super-Critical Pressure.

relationship between the solubility of the substance in steam and the temperature, though unfortunately adequate information about this subject is not always available. The different substances that occur in feed water are then considered in turn, including various sodium, calcium and magnesium compounds and silica. The zones of maximum deposition of calcium and sodium sulphates in a once-through boiler at pressures of 240 and 300 atms have been calculated from data about the solubility of these substances as a function of super-heated steam temperature: the results are given in Table 2. It will be seen that the temperature range of scaling is only 38°C, but that it corresponds to the considerable increase in steam enthalpy of 195 kcal/kg. The temperature range of maximum deposition of sodium and calcium sulphates is 63°C with an enthalpy increase of 231 kcal/kg. The region of extensive deposition is broadened if the quality of feed water is impaired, as will be seen from the results plotted in Figs 2 and 3. The influence of mass exchange on the rate of deposition of