RUMANIA

POPOVICI, V., Veterinarian of the "Pasteur" Institute for Veterinary Research and Biological Products (Institutul de Cercetari Veterinare si Biopreparate "Pasteur").

"The International Symposium on Ornithosis of Greifswald."

Bucharest, Revista de Zootehnie si Medicina Veterinara, Vol 13, No 10, Oct 63, pp 69-71.

Abstract: Reviews the proceedings of the International Symposium on Ornithosis of 13-14 June 1963 held at Greifswald in East Germany. Organized under the auspices of the German Hygiene Society, the Faculty of Medicine of "Ernst-Moritz-Arndt" University of Greifswald, the "Fr. Loeffler" Institute of Riems of the German Academy of Agricultural Sciences and the International Association of Agricultural Medicine, the symposium considered the following: the epidemiology and virology of ornithosis, ornithosis from the point of view of clinical workers, and ornithosis as a professional disease.

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APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001342510010-4"

38

Bucharest, Farmacia, Vol X, No 4, Apr 1962 159

1. "Rheology and Its Importance in Pharmaceutics," Farm A. SCHEIDER, Farm Engr V. POPOVICI and Farm A. SPITZER; pp 193-201.

2. "Investigations in the Mono-etheralkylresorcin Class (VII). New Compounds Having an Antihelminthic Action," Dr V. ZOTTA, Farm D. OTRIEANU, Farm Aurora MORAIT, Farm C. CHIRITA and Prof Al. MAVRODIN. Work performed at the Laboratory of Organic Chemistry (Laboratorul de Chimie Organica) of the School of Pharmacy (al Facultatii de Farmacie), Bucharest; English summary; pp 203-212.

3. "Contributions to the Study of the Stability of Chloral Hydrate and Sodic Luminal Solutions," Engr Farm N. [illegible], Farm Vasilica ANTONESCU and Farm St. MOISESCU; English summary; pp 213-218.

4. "On the Antituberculous Activity of Certain Hydrazid Derivatives of the α-Benzoylaminocinnamic Acid and Phenylacetic Acid Series (Note II)," Prof A. [illegible], Prof M. VASOVEIOVICI, Conf P. GHEORGHIU, Dr V. [illegible], Chemist Viorica BRATU, Chemist Catalina DEMETRESCU, Dr Em. MATEESCU, Dr Em. POPESCU and Dr A. POPA; English summary; pp 219-227.

5. "Study of the Antituberculous Action of Certain New Thioureic Derivatives (4 Methylthiazolin-Urea)," Conf P. GHEORGHIU, Conf C. MARCU, Chemist Viorica BRATU, Dr D. DOBRESCU, Dr H. MANUCHIAN, Dr V. STEORSCU, Dr A. POPA, Dr Em. POPESCU and Chemist Rita SCHWARTZ; English summary; pp 229-233.

6. "Study of Gelatin Excipients for Various Galenic Substances with a Prolonged Action," Prof V. CIOCANELEA, Farm I. BAN, Farm V. [illegible], Dr I. [illegible] and Dr S. [illegible]. Work performed at the Galenic Department (Catedra de Galenica) of Clinic II for Gynecology (Clinica II-a de Ginecologie); pp 235-237.

7. "Contribution to the Study of the Copper Content of Bread Made of Various Flours," Farm V. LUPSA and Farm V. BODEANU; English summary; pp 239-242.

1/2

NANU, A.; NICHICI, A.; POPOVICI, V.

The M.A.M.B.1 anodic and mechanical machine cutting with band. Studii tehn Timisoara 10 no.2:377-389 J1-D '63.

Experimental and theoretical studies on the anodic and mechanical electroerosive flow productivity of the M.A.M.B.1 machine. 391-400

POPOVICI, V., dr. ing.

New graphic representation of heat cycles using a diagram p-i with rectilinear adiabatic lines. Energetica Rum 12 no. 5:205-210 My '64.

SPITZER, A.; SCHWEIGER, A.; POPOVICI, V.

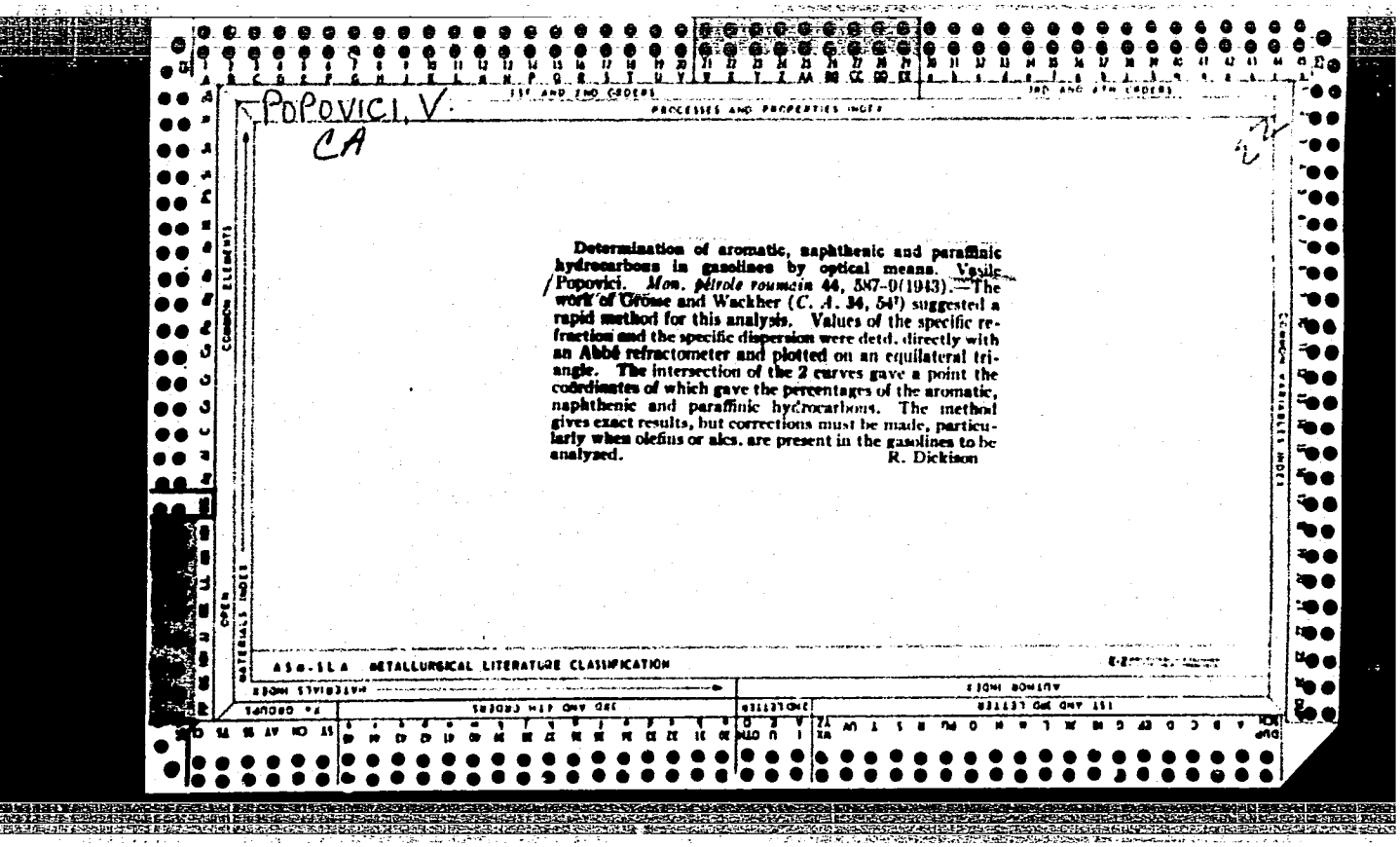
Volumetric determination of the phosphate ion using as indicator chromatable acid blue. Rev chimie Min petr 15 no.9:576 S '64.

1. The work was carried out in the Regional Laboratory for Medicine Control, Timisoara.

POPOVICI, Valer; SCHWEIGER, Bela; SPITZER, Endre

Determination of 2-ethoxy-6,9-aminoacridine lactate (Rivanol) with sodium nitrite. Acta pharm. Hung. 35 no.6:252-255 N '65.

1. Submitted February 26, 1965.



POPOVICI, V.
CA

Determination of aromatic, naphthenic and paraffinic hydrocarbons in gasolines by optical means. Vasile Popovici. *Mon. pétrole roumain* 44, 587–0(1943).—The work of Grose and Wackher (*C. A.* 34, 54[3]) suggested a rapid method for this analysis. Values of the specific refraction and the specific dispersion were detd. directly with an Abbé refractometer and plotted on an equilateral triangle. The intersection of the 2 curves gave a point the coördinates of which gave the percentages of the aromatic, naphthenic and paraffinic hydrocarbons. The method gives exact results, but corrections must be made, particularly when olefins or alcs. are present in the gasolines to be analyzed.
R. Dickison

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

POPOVICI, Victor, prof. (Iasi)

From the activities of the circles of mathematics and physics of the students of professional schools at Iasi. Gaz mat B 13 no.1: 51-52 Ja '62.

POPOVICI, Vladimir, ing.; HEINRICH, Alexandru, ing. (Craiova)

Outstanding technical achievements at the Electroputere Plant in Craiova. Electrotehnica 12 no.1/2:27-38 Ja-F '64.

1. Technical Director at the "Electroputere" Plant, Craiova (for Popovici, Heinrich).

POPOVICI, Vladimir; STANCIU, Valeriu, ing.

The "Electroputere" Works in Craiova, an achievement of the Rumanian People's Democracy. Electrotehnica 10 no.6:215-225 Je '62.

1. Director tehnic (for Popovici). 2. Inginer sef (for Stanciu).

RUMANIA/Farm Animals. Honey Bees Q-5

Abs Jour : Ref Zhur - Biol., No 19, 1958, No 88198

Author : Popovici V.
Inst :
Title : Nectarous Importance of the Linden Tree and Its Spread in the Forests of Rumania

Orig Pub : Apicultura, 1957, No 12, 13-18

Abstract : The lindens in Rumania occupy 67,000 hectares, or 1 percent of the total forest area. The per-hectare producitivity of the linden depends on the development of its limbs, conditions of the soil and atmosphere, and elevation of the locality. Among the three varieties and several hybrids of the linden, the white linden Tilia argentea is an especially nectarous one. In recent years, large linden plantations are being established in Rumania, with the participation of bookeepers. -- M.N. Zimmev.

Card : 1/1

POPOVICI, V.

Some conclusions drawn from the printing upon certain varieties of offset paper. p. 292.

CELULOZA SI HIRTIE. (Asociatia Stiintifica a Inginerilor si Technicienilor din Rominia si Ministerul Industriei Petrolului si Chimie) Bucuresti, Rumania. Vol. 8, no. 9, Sept. 1959.

Monthly List of East European Accessions (EEAI) LC, Vol. 9, no. 2, Feb. 1960.

Uncl.

IOSIFOVICI, V., ing.; POPOVICI,V., ing.

Determining the molecular weight and polymerization degree of cellulose by the viscosimetric method, using the Staudinger apparatus. Cel hirtie 10 no.4:128-133 Ap'61

POPOVICI, V., ing.; CONSTANTINESCU, O., ing.

Laboratory research on the production of chemical and mechanical pulps from annual plants by the cold soda process. Celhirtie 11 no.7:252-264 Jl'62.

L 41547-65 EWT(m)/EWP(t)/EWP(b) IJP(c) JD
ACCESSION NR: AP5012416 RU/0003/64/015/009/0576/0576 15 B

AUTHOR: Spitzer, A.; Schweiger, A.; Popovici, V. 17

TITLE: Volumetric determination of the phosphate ion using chromatable acid blue as indicator

SOURCE: Revista de chimie, v. 15, no. 9, 1964, 576

TOPIC TAGS: volumetric analysis, phosphate, ion

Abstract: The authors found that "black chromatable acid A" and especially "chromatable acid blue", acids of the o,o'-dioxazo-naphthalene group produced by the "Colorom" of Codlea, are suitable as indicators for the volumetric determination of phosphate ion. The determination under proper conditions with chromatable acid blue as indicator (1:100 with sodium chloride) is selective and rapid, giving a clear color change at the endpoint from clear blue to reddish violet.

Orig. art. has 2 formulas.

ASSOCIATION: Lucrarea a fost efectuata in Laboratorul regional pentru controlul medicamentelor din Timisoara (Regional Laboratory for the Control of Drugs)

Card 1/2 Submitted 00

NANU, A.; POPOVICI, V.; NICHICI, Al.; ACHIMESCU, N.

Determining the conditions of automatic control of the advance in electroerosive discharge. Bul St si Tehn Tim 9 no.2:419-430 Jl-D '64.

POPOVICI, V.V.; VICTOR, C.

Additional remuneration of field team collectivists. Probleme econ 17 no.5:32-45 My '64.

4

POPOVICI, V. V.
~~SURNAME (in caps)~~; Given Names

Country: Rumania

Academic Degrees: Engineer

Affiliation: Research Institute for the Cultivation of Corn (Institutul de Cercetari pentru Cultura Porumbului)

Source: Bucharest, Probleme Zootehnice si Veterinare, No 4, 1961, pp 11-18.

Data: "Organization of the Green Corn Conveyor for Bulls."

Co-authors:

BEREA, L., Engineer, Research Institute for the Cultivation of Corn (Institutul de Cercetari pentru Cultura Porumbului).
STRIMBU, I., Engineer, Research Institute for the Cultivation of Corn (Institutul de Cercetari pentru Cultura Porumbului).
STANESCU, I., Engineer, Research Institute for the Cultivation of Corn (Institutul de Cercetari pentru Cultura Porumbului).
CHIRITA, N., Engineer, Research Institute for the Cultivation of Corn (Institutul de Cercetari pentru Cultura Porumbului).

Popovici, V.V.

5

STANESCU, I.
Surname (in caps); Given Names

Country: Rumania

Academic Degrees: Engineer

Affiliation: Research Institute for the Cultivation of Corn (Institutul de Cercetari pentru Cultura Porumbului).

Source: Bucharest, Probleme Zootehnice si Veterinare, No 6, 1961, pp 18-23.

Data: "The Economic Efficiency of the Valuation of Corn in the Feeding of Milk Cows."

Co-authors:

POPOVICI, V.V., Engineer, Research Institute for the Cultivation of Corn (Institutul de Cercetari pentru Cultura Porumbului).

CRISAN, I., Engineer, Research Institute for the Cultivation of Corn (Institutul de Cercetari pentru Cultura Porumbului

PAPAHAGI,E., conf.; CIUREL, M., dr.; POPOVICI, Z., dr.; CIOBANU, M., dr.

On emergency portacaval anastomosis. Med. intern. (Bucur.) 16 no.10:1239-1244 O '64

1. Lucrare efectuata in Clinica a II-a de chirurgie, Spitalul de adulti al Raionului "30 Decembrie" (director prof. I.Turai, membru corespondent al Academiei Republicii Populare Romine).

E. A. POPOVICI-STANCOVICI, P.

10

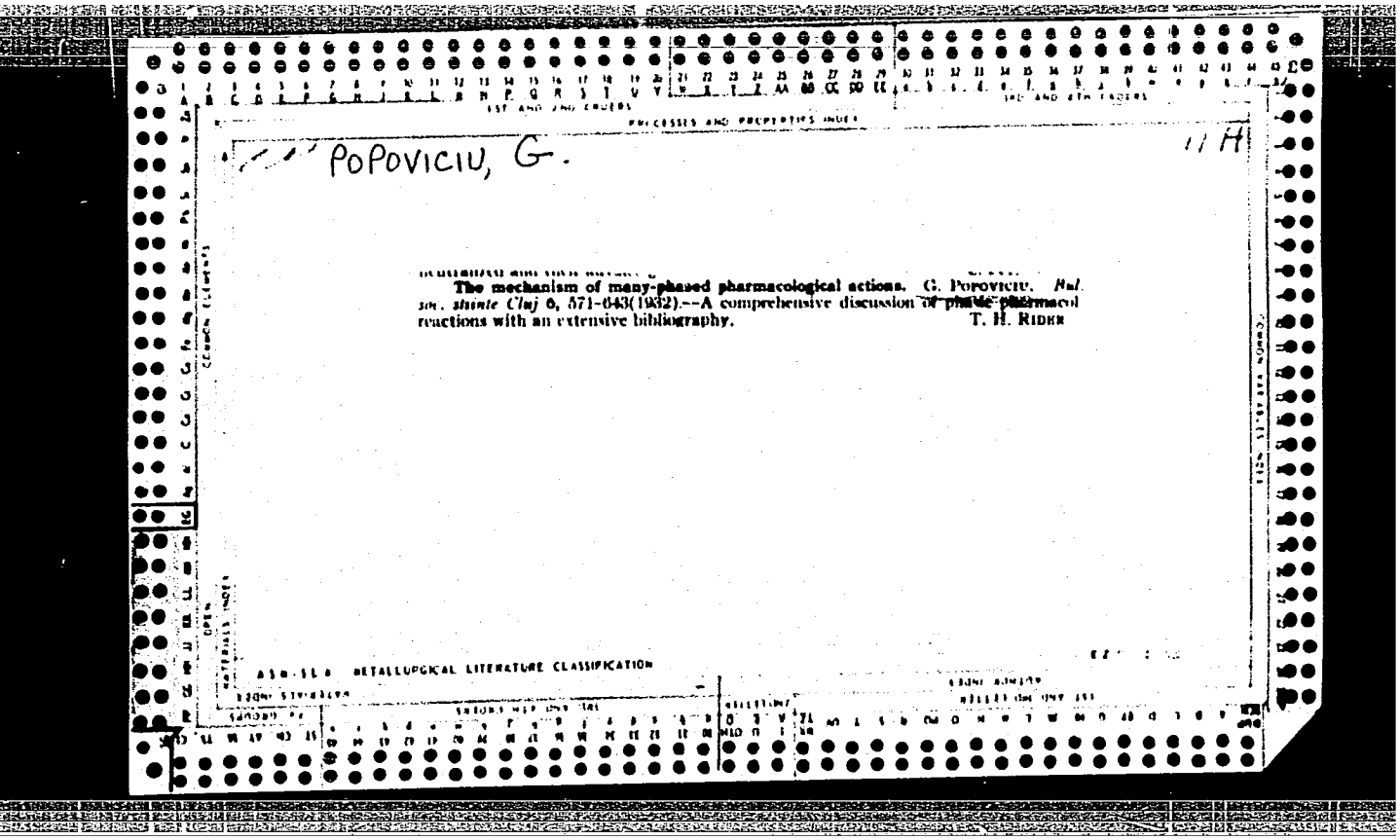
The constitution of semicarbazides of dibasic acids. I. Protopopescu and P. Popovici-Stancovici. *Acad. Rep. Populare Romîne, Bul. Stiinț.* A, 1, 885-92 (1949) (French summary).—$H_2NCONHNH_2.HCl$ (I) condenses with anhydrides of dibasic acids to form 2 types of compds., depending upon the nature of the acid: (a) (CO_2H)$CONHNHCONH_2$, and (b) ($CO_2NHNHCONH_2$; (a) do not decomp. when treated with H_2SO_4 or KOH. Phthaloylsemicarbazide (II) prepd. by a modified Banerjee method (*C.A.* 29, 3009[3]) (in AcOH in the presence of NaOAc), m. 249-50°, and had a structure of type (a); with anisaldehyde was obtained *o*-$C_6H_4(CO_2NCONHN:CHC_6H_4OMe$, m. 188°. With 3-nitrophthalic anhydride I yielded a compd. (IV), never prepd. before, m. 250°; when it was heated with anisaldehyde the NO_2 group was eliminated and the condensation product was identical with III. II (2 g.) heated 15 min. on an oil bath with 2 g. BzH formed a compd. $C_{15}H_{10}O_2N_2$, m. 171°.

G. A.

POPOVICIU, Gabriel, ing.

Electropneumatic brakes. Rev cailor fer 13 no.2:102-109, 112 F '65.

1. D.T.V. Section, "23 August" Plant.



POPOVICIU, G.

The mechanism of many-phased pharmacological actions. G. Popovicu. *Bul. sti. stiinte Cluj* 6, 571-643(1932).--A comprehensive discussion of phasic pharmacol reactions with an extensive bibliography. T. H. RIDER

MANTA, I.; DUMA, D.; LAZAR, Tr.C.; POPOVICIU, L.; CATANA, Rozalia; PIRVU, Maria; SERBAN, M.

Biochemical research on experimental allergic encephalomyelitis. Pt.2. Fiziol. norm. pat. 11 no.3:237-242 My-Je '65.

1. Catedra de biochimie si Clinica de neurologie, Institutul medico-farmaceutic, Cluj.

DUMA, D.; SERBAN, M.; POPOVICIU, L.; LAZAR, Tr.; MARES, V.; TARANU, Al.

Histochemical research in various muscular diseases. Stud. cercet. neurol. 10 no.3:159-165 Je '65.

Popoviciu, T.

Popoviciu, Tiberiu. On monotone series. Pozitiva 1, 41–45 (1940). (Romanian. French summary)

It is first shown that every sequence of $\frac{1}{2}n!$ elements ($n \geq 3$) contains a subsequence of n elements which is monotone (nondecreasing or nonincreasing). There therefore exists a number N_n such that every sequence of N_n elements contains a monotone subsequence of n elements, while there is a sequence of $N_n - 1$ elements having no monotone subsequence of n elements. The first statement implies that $N_n \leq \frac{1}{2}n!$. On the other hand the following special sequence of $(n-1)^2$ elements, $n-1, n-2, \cdots, 2, 1, 2n-2, 2n-3, \cdots, n, 3n-3, 3n-4, \cdots, 2n-1, \cdots, (n-1)^2, (n-1)^2-1, \cdots, (n-1)^2-(n-2)$, has no monotone subsequence of n elements. Hence $(n-1)^2 < N_n \leq \frac{1}{2}n!$. The author adds, without proof, that very likely $N_n = (n-1)^2+1$, for all values of n. [This is actually true, as was shown in a somewhat wider context by P. Erdös and G. Szekeres, Compositio Math. 2, 463–470 (1935).] *I. J. Schoenberg* (Philadelphia, Pa.).

2

SMW

Science Mathematical Reviews, Vol [illegible] No. 7

Popoviciu, Tiberiu

Source: Mathematical Reviews, Vol. 8 No. 6

Popoviciu, Tiberiu. Notes sur les fonctions convexes d'ordre supérieur. X. Sur quelques propriétés des différences divisées et des polynomes de Lagrange. Ann. Sci. Univ. Jassy. Sect. I. 28, 161–207 (1942).

[For note IX see Bull. Math. Soc. Roumaine Sci. 43, 85–141 (1941); these Rev. 7, 116.] A real function $F(x)$, defined on a linear set E, is said to be nonconcave of order k if the divided difference $[x_1, x_2, \cdots, x_{k+1}; f] \geqq 0$ for every set of $k+2$ distinct points of E. The author studies the relations between $f(x)$ and the polynomial $L(x_1, \cdots, x_{n+1}; f|x)$ of degree at most n interpolating $f(x)$ at the points $x_1, \cdots, x_{n+1}$ of E. It is shown that if E is a finite set composed of exactly m points ($m \geqq n+1$) there is always an interpolating polynomial dominating the function, i.e., such that $L(x_1, \cdots, x_{n+1}; f|x) \geqq f(x)$ for $x \in E$. Again, for E finite and $f(x)$ nonconcave of order k it is shown that there always exists an interpolating polynomial of given degree n ($>k+1$) which is also nonconcave of order k on the set E, provided k and n are of different parities. However, if k and n are of the same parity, this property need no longer hold, being now dependent on the geometric configuration of the set E. This point is studied in detail for $k=0$, $n=2$, $n=4$, and also for some other cases with $k>0$. The paper concludes with a discussion of dominating interpolating polynomials for the case when E is a finite closed interval with suitable assumptions on $f(x)$. Here the author uses the polynomials of best approximation.

I. J. Schoenberg.

Popoviciu, Tiberiu

Popoviciu, Tiberiu. On regular polygons. Pozitiva 2, 92–97 (1941). (Romanian)

Let $A_0, \cdots, A_{n-1}$ be the vertices of a regular $n$gon, P any point of its plane. Let $M_r(P)$ be the rth root of the arithmetic mean of the rth powers of the distances from P to $A_0, \cdots, A_{n-1}$. The author determines bounds for $M_r(P)/M_s(P)$ for various values of r and s. In particular, $M_1(P)/M_2(P) \geqq 2^{1-n} \cot(\frac{1}{2}\pi/n)$. *R. P. Boas, Jr.*

LFH

Source: Mathematical Reviews, Vol 8, No. 4

LFH

PoPoviciu, Tiberiu

2000

Popoviciu, Tiberiu. Sur une inégalité. Mathematica, Timişoara 23, 127–128 (1948).

Given a continuous strictly increasing real function φ with inverse φ^{-1} on an open real interval I and a sequence $M=(x_\nu)$ of m points x_ν of I, define $m_\varphi M=\varphi^{-1}(\bar{\varphi}(M))$, where $\bar{\varphi}(M)=m^{-1}\sum\varphi(x_\nu)$ is the arithmetic mean of φ over M. Furthermore, given two real functions φ and ψ on I and a sequence P of mn points of I, define $m_\varphi n_\psi P=m_\varphi(n_\psi(N_\nu))$, where $P=(N_\nu)$ is the decomposition of P into m consecutive sequences N_ν each containing n points. Let P' be a monotone rearrangement of P. It is shown that $m_\varphi n_\psi P'\geqq m_\varphi n_\psi P$ provided the function $\varphi\psi^{-1}$ is convex. This generalizes a known result of L. A. Le Cointe which corresponds to the special case $m=2$, $\varphi=x$, $\psi=\log x$ [Nouv. Ann. Math. (1) 2, 372–374 (1843)]. *W. Gustin* (Bloomington, Ind.).

Source: Mathematical Reviews, Vol 10 No. 4

POPOVICIU, TIBERIU

3000

Popoviciu, Tiberiu. Sur les fonctions d'une variable réelle dont l'ensemble de définition est la réunion de deux sous-ensembles de monotonie opposée. An. Acad. Repub. Pop. Române. Sect. Şti. Mat. Fiz. Chim. Ser. A. 3, 1–16 (1950). (Romanian. Russian and French summaries)

The author first gives a new proof of his known result [Acad. Roum. Bull. Sect. Sci. 20, 45–49 (1939); these Rev. 1, 71] that the set E of definition of a real function of a real variable is decomposable into two consecutive subsets, on which the function is monotone in opposite senses, if and only if this property holds for each set of three points of E. Next, dropping the requirement that the subsets be consecutive, he points out that there are functions defined on sets E of four points for which the required decomposition is not possible; but he shows that if E contains more than four points then the decomposition is possible for E if and only if it is possible for every set of five points of E.

E. F. Beckenbach (Princeton, N. J.).

Source: Mathematical Reviews, Vol 13No. 4

Popoviciu, T.

Popoviciu, Tiberiu. Considérations théoriques sur l'utilisation pratique de certaines formules d'interpolation. Acad. Repub. Pop. Române. Bul. Şti. Secţ. Şti. Mat. Fiz. 3 (1951), 441–449 (1952). (Romanian. Russian and French summaries)

The author investigates what happens to Newton's divided-difference interpolation formula when the interpolation points are numbered arbitrarily instead of in increasing order. He concludes that numbering in increasing order is best, and that the most favorable formulas are those which reduce to Euler's, Stirling's or Bessel's in the case of equidistant points. *R. P. Boas, Jr.* (Evanston, Ill.).

POPOVICIU, TIBERIU

~~H-U-M-G~~ E-F/W

POPOVICIU, TIBERIU: On the Remainder in Some Formulas of Numerical Derivation. I. Some Properties of Formulas of Numerical Derivation Having the Largest Degree of Exactitude

Popovieiu, Tiberiu. Sur le reste dans quelques formules de dérivation numérique. I. Quelques propriétés des formules de dérivation numérique d'exactité maximum. Acad. Repub. Pop. Române. Stud. Cerc. Mat. 3, 53–122 (1952). (Romanian. Russian and French summaries)

The formulas which the author considers are of the form

$$(1)\qquad f^{(n+r)}(x_0)=\sum_{j=0}^{r-1}a_jf^{(j)}(x_0)+\sum_{i=1}^{s}\sum_{j=0}^{r_i-1}a_{i,j}f^{(j)}(x_i),$$

with a remainder R. The order is $r-1+\sum(r_i-1)+s$ ($+1$ if $r>0$). The degree of exactitude is the smallest integer n such that $R=0$ for all polynomials of degree n but $R\neq 0$ for some polynomial of degree $n+1$. The author is chiefly concerned with the formula (E) obtained by taking the right-hand side of (1) to be the Lagrange-Hermite interpolating polynomial of $f(x)$ with nodes x_0 and x_i, each repeated according to its multiplicity. He shows that (E) has the largest degree of exactitude of all formulas (1) with the same r and r_i. Generally speaking, the order exceeds the degree of exactitude by 1; otherwise these

quantities are equal and the formula is called exceptional. The author gives a number of theorems on this situation. Formula (E) is called reducible if, when written in the form (1), it does not involve any values of $f(x)$ (but only of its derivatives). The remainder R is said to be of simple form if it can be put in the form of a constant A times an $(n+2)$-point divided difference of $f(x)$. This is shown to happen if and only if $R=0$ for all $f(x)$ which are convex of order n. Necessary and sufficient conditions are given for the remainder to be of simple form when the degree of exactitude is -1, 0 or 1. A number of sufficient conditions are given in higher cases. The author lays particular stress on the results that (E) has a remainder of simple form if the nodes are symmetric with respect to x_0. There is detailed discussion of the case $n=1$. Finally the author shows how to write out a formula (E) explicitly, and writes out explicitly the 76 reducible, exceptional and symmetric formulae whose degrees of exactitude are at most 5. *R. P. Boas, Jr.*

POPOVICIU, T.

Achievements and tasks of the mathematics and physics sections.

p. 107
Vol. 4, no. 2, 1955
ANALELE
Bucuresti

SO: Monthly List of East European Accessions (EEAL), LC, Vol. 5, no. 12
December 1956

On the Precision of Numerical Calculations by Interpolating With Newton's Polynomial

Popoviciu, Tiberiu. Sur la précision du calcul numérique dans l'interpolation par le polynome Newton à noeuds équidistantes. Acad. R. P. Romîne. Fil. Cluj. Stud. Cerc. Şti. Ser. I. 6 (1955), no. 3–4, 27–35. (Romanian. Russian and French summaries)

In calculating the value of Newton's polynomial,

$$f(a+xh)\approx L(x)\equiv\sum_{\nu=0}^{n}\frac{x(x-1)\cdots(x-\nu+1)}{\nu!}\Delta_h^{\nu}f(a),$$

one uses the algorithm

$$y_{\nu+1}=\Delta_h^{n-\nu}f(a)+\frac{x-n+\nu}{n-\nu+1}y_\nu,\quad \nu=0,1,\cdots,n;$$

$$y_0=0;\ y_{n+1}=L(x)$$

Approximations used in the successive calculations result in an accumulation of errors in the final value y_{n+1}. The author develops a formula for the total error ε, and thereby obtains a bound on $|\varepsilon|$, in terms of x and of the maximum absolute value of the successive errors. For discrete values of x, by tenths from 0 to 1, tables of factors are constructed to facilitate the calculations.

E. F. Beckenbach (Los Angeles, Calif.)

POPOVICIU, TIBERIU

2 I-F\W

On Some Functional Equations

Popoviciu, Tiberiu. Sur quelques équations fonctionnelles. Acad. R. P. Romîne. Fil. Cluj. Stud. Cerc. Şti. Ser. I. 6 (1955), no. 3–4, 37–49. (Romanian. Russian and French summaries)

Let $V\begin{pmatrix} f_0, & f_1, & \cdots, & f_n \\ x_1, & x_2, & \cdots, & x_{n+1} \end{pmatrix}$ denote the determinant of values $f_{j-1}(x_i)$, $i, j=1, 2, \cdots, n+1$, and let

$$\Delta_h(x; f_0, f_1, \cdots, f_n)=V\begin{pmatrix} f_0, & f_1, & \cdots, & f_n \\ x, & x+h, & \cdots, & x+nh \end{pmatrix}.$$

In the first part of the present paper, the author shows that if the functions $f_i(x)$, $i=0, 1, \cdots, n-1$, are continuous and satisfy $V\begin{pmatrix} f_0, & f_1, & \cdots, & f_{n-1} \\ x_1, & x_2, & \cdots, & x_n \end{pmatrix} \neq 0$ for each set of n distinct points x_i, $i=1, 2, \cdots, n$, in the interval $[a, b]$, then the general solution of the functional equation $\Delta_h(x; f_0, f_1, \cdots, f_{n-1}, f)=0$, $x, x+nh \in [a, b]$, is of the form $f(x)=c_0f_0(x)+\cdots+c_{n-1}f_{n-1}(x)$, where the c_i are arbitrary constants. [See the following review.]

Let $D\begin{pmatrix} x_1, \cdots, x_{m+1} \\ y_1, \cdots, y_{m+1} \end{pmatrix}; F\Big)$ denote the determinant of values $F(x_i, y_j)$, $i, j=1, \cdots, m+1$. A function of the form

Gw

Popoviciu, Tiberiu

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$F(x, y)=\sum_{i=1}^{m} f_i(x)g_i(y)$ is said to be a quasi polynomial of degree m; the degree is said to be effective, if the functions $f_i(x)$, and also the functions $g_i(y)$, are linearly independent. In the second part of the paper, it is shown that quasi polynomials of degree m are characterized by the functional equation $D\begin{pmatrix} x_1, \cdots, x_{m+1} \\ y_1, \cdots, y_{m+1} \end{pmatrix}; F\Big)=0$. Further, it is shown that if $F(x, y)$ is continuous with respect to x and with respect to y (separately) in $a\leq x\leq b, c\leq y\leq d$, satisfies $D\begin{pmatrix} x_1, \cdots, x_m \\ y_1, \cdots, y_m \end{pmatrix}; F\Big) \neq 0$ for arbitrary distinct points $x_1, \cdots, x_m$ in $[a, b]$ and for arbitrary distinct points $y_1, \cdots, y_m$ in $[c, d]$, and satisfies

$D\begin{pmatrix} x, x+h, \cdots, x+mh \\ y, y+k, \cdots, y+mk \end{pmatrix}; F\Big)=0$ for arbitrary x, y, h, k such that $x, x+mh \in [a, b]$, $y, y+mk \in [c, d]$, then $F(x, y)$ is a quasi polynomial of degree m and the degree is effective.

E. F. Beckenbach (Los Angeles, Calif.)

POPOVICIU, T.

1-FW

Popoviciu, Tiberiu. Sur une généralisation de la formule d'intégration numérique de Gauss. Acad. R. P. Romîne. Fil. Iaşi. Stud. Cerc. Şti. 6 (1955), 29–57. (Romanian. Russian and French summaries)

Let $A[f]$ be an additive and homogeneous real-valued functional defined for all real polynomials $f=f(x)$ of the variable x. Let there be given n distinct real points $x_1, \cdots, x_n$ (the knots) and corresponding natural numbers $r_1, \cdots, r_n$ (the multiplicities). Given $f(x)$ let

$$\varphi(x)=\sum_{i=1}^{n}\sum_{j=0}^{r_i-1}\varphi_{i,j}(x)f^{(j)}(x_i) \tag{1}$$

be the Lagrange-Hermite interpolation polynomial of degree at most $p=r_1+\cdots+r_n-1$ which agrees with $f(x)$ at the knots with the corresponding multiplicities. Many approximation formulae are obtained by using $A[\varphi]$ as an approximation to $A[f]$. From (1), setting $c_{i,j}=A[\varphi_{i,j}]$ we obtain the approximation formula

$$A[f]\approx\sum_{i=1}^{n}\sum_{j=0}^{r_i-1}c_{i,j}f^{(j)}(x_i). \tag{2}$$

This relation is evidently exact if the degree of f does not exceed p. The relation (2) is called of Gaussian type provided that it is exact for every polynomial of degree $\leqq p+n$. This is the generalization announced in the title. The functional $A[f]$ is said to be of order of positivity h provided that $A[Q^2]>0$ for every real polynomial Q of

Popoviciu, Tiberiu

degree $\leq k-1$ which does not vanish identically. The main result of this interesting paper is the following theorem. Let $A[f]$ be a functional of the order of positivity k and let the integer n be given, as well as the n odd integers $r_1, \cdots, r_n$ such that (3) $r_1+\cdots+r_n+n<2k$. Then there exists a corresponding set of distinct knots $x_1, \cdots, x_n$ such that the formula (2) is of Gaussian type. For functionals $A[f]$ which are positive to any given order k, the inequality condition (3) may be disregarded. In this case and when all odd multiplicities r are equal to each other the result was previously obtained by P. Turán [Acta Sci. Math. Szeged 12 (1950), Pars A, 30–37; MR 12, 164]. Of importance in the proof are the functionals of the special form (4) $A[f]=\sum_{i=1}^{k}\lambda_i f(y_i)$ ($\lambda_i>0$, y_i distinct). The existence of Gauss-type formulae is first shown for the class of functionals (4); later a general $A[f]$ is shown to be identical with an appropriate functional (4) for the class of polynomials of degree $\leq 2k-1$. The existence proof for a functional (4) is based on the following minimum problem: Given the functional (4), natural integers $n_1, \cdots, n_q$ and positive numbers $s_1, \cdots, s_q$ all >1, to minimize $A[\Pi_{i=1}^{q}|\pi_i|^{s_i}]$, where $\pi_i=x^{n_i}+\cdots$ is an arbitrary real polynomial of degree n_i with highest coefficient unity. Several examples of new Gaussian-type formulae conclude the paper.

I. J. Schoenberg

Popovici, T.

16(1) PHASE I BOOK EXPLOITATION SOV/2660

Vsesoyuznyy matematicheskiy s'yezd. 3rd, Moscow, 1956

Trudy, t. 4: Kratkoye soderzhaniye sektsionnykh dokladov. Doklady inostrannykh uchenykh (Transactions of the 3rd All-Union Mathematical Conference in Moscow, vol. 4: Summary of Sectional Reports. Reports of Foreign Scientists) Moscow, Izd-vo AN SSSR, 1959. 247 p. 2,200 copies printed.

Sponsoring Agency: Akademiya nauk SSSR. Matematicheskiy institut.

Tech. Ed.: O.N. Shevchenko; Editorial Board: A.A. Abramov, V.G. Boltyanskiy, A.M. Vasil'yev, B.V. Medvedev, A.D. Myshkis, S.M. Nikol'skiy (Resp. Ed.), A.G. Postnikov, Yu. V. Prokhorov, K.A. Rybnikov, P. L. Ul'yanov, V.A. Uspenskiy, N.G. Chetayev, O. Ye. Shilov, and A.I. Shirshov.

PURPOSE: This book is intended for mathematicians and physicists.

COVERAGE: The book is Volume IV of the Transactions of the Third All-Union Mathematical Conference, held in June and July 1956. The book is divided into two main parts. The first part contains summaries of the papers presented by Soviet scientists at the Conference that were not included in the first two volumes. The second part contains the text of reports submitted to the editor by non-Soviet scientists. In those cases when the non-Soviet scientist did not submit a copy of his paper to the editor, the title of the paper is cited and, if the paper was printed in a previous volume, reference is made to the appropriate volume. The papers, both Soviet and non-Soviet, cover various topics in number theory, algebra, differential and integral equations, function theory, functional analysis, probability theory, topology, mathematical problems of mechanics and physics, computational mathematics, mathematical logic and the foundations of mathematics, and the history of mathematics.

Card 26/34

POPOVICIU, Tiberiu, prof.

On the remainder in some linear formulas of the approximation of the analysis. Studii cer mat 10 no.2:337-389 '59.
(EEAI 10:9/10)

1. Membru corespondent al Academiei R.P.R., redactor responsabil, "Studii si cercetari de matematica" (Filiala Cluj).

(Mathematics) (Functions) (Approximate computation)

POPOVICIU, Tiberiu, prof.(Cluj)

Divided and derived differences. Studii cerc mat Cluj 11 no.1: 119-145 '60. (EEAI 10:9)

1. Membru corespondent al Academiei R.P.R.; Comitetul de redactie "Studii si cercetari de matematica" redactor responsabil.

(Difference equations) (Approximate computation)
(Vector analysis)

S/044/63/000/002/035/050
A060/A126

AUTHOR: Popoviciu, Tiberiu

TITLE: On the precision of numerical calculation in the interpolation by polynomials of two variables

PERIODICAL: Referativnyy zhurnal, Matematika, no. 2, 1963, 18, abstract 2V66 (Studii şi cercetări mat. Acad. RPR Fil. Cluj, 1960, v. 11, no. 1, fasc. anexă; 159 - 165; Rumanian; summaries in Russian, French)

TEXT: A theoretical foundation is given for the practical utilization of the best known interpolation formulae, for example, of the Newton, Stirling, Bessel, and other formulae. To compute the values of the interpolation polynomial

$$L(x,y)=\sum_{i=0}^{m}\sum_{j=0}^{n_i}(x-x_{r_1})(x-x_{r_2})\dots(x-x_{r_i})\times \times(y-y_{s_1})(y-y_{s_2})\dots(y-y_{s_j})D^{i,j}_{r,s}[U], \quad (1)$$

where $0 \leq n_i \leq n$, $i = 0, 1, \dots, m$, one computes sums of the form

Card 1/3

On the precision of numerical calculation in ....

$$\sum_{i=0}^{m} x_0 x_1 \dots x_i A_i \tag{2}$$

The numbers A_i are related by the equation

$$A_i = \sum_{j=0}^{n_i} Y_0 Y_1 \dots Y_j E_{i,j} \quad (i = 0, 1, \dots, m), \tag{3}$$

where

$$Y_j = \frac{y - y_j}{l_j}, \quad Y_0 = 1; \quad X_0 = 1,$$

$$X_i = \frac{x - x_{r_i}}{k_i}; \quad E_{i,j} = k_0 k_1 \dots k_i l_0 l_1 \dots l_j D^{i,j}_{r_i, s_j}$$

Here the numbers X_i, Y_j, $E_{i,j}$ are related to the functions f (x, y) by the distributed differences

$$D^{i,j}_{r_i, s_j}, \quad i = 0, 1, \dots, m; \quad j = 0, 1, \dots, n,$$

corresponding to the substitution (x_{r_i}, y_{s_j}) of the interpolation points. The sums (2), (3) have a structure of the type

Card 2/3

On the precision of numerical calculation in ...

$$c_0C_0+c_0c_1C_1+\ldots+c_0c_1\ldots c_aC_a \quad (1)$$

They are computed according to the scheme

$$c_0(C_0+c_1(C_1+\ldots+c_{a-1}(C_{a-1}+c_aC_a)\ldots)),$$

in which the multiplications by c_a, c_{a-1}, ..., c_0 are coupled with errors less than the number ε in absolute value. It is demonstrated that then the most precise of the polynomials (1) are those for which the sequences

$$|x-x_{r_1}|, |x-x_{r_2}|, \ldots, |x-x_{r_{n+1}}|,$$
$$|y-y_{s_1}|, |y-y_{s_2}|, \ldots, |y-y_{s_{n+1}}|$$

are nondecreasing.

I.F. Shelikhova

[Abstracter's note: Complete translation]

Card 3/3

POPOVICIU, Tiberiu, prof.

15 years sine the liberation of our country. Studii cerc mat Cluj 10 no.1:7-15 '59. (EEAI 10:6)

1. Academia Republicii Populare Romine, mumb-u corespondent; Comitetul de redactie, Studii si cercetari de matematica (Filiala Cluj, Institutul de calcul), redactor responsabil.
(Rumania--History) (Rumania--Mathematics)

RUMANIA

SIRBU, Z., Dr, and POPOVICI, V., Veterinarian, of the "Pasteur" Institute for Veterinary Research and Biological Products (Ins. de Cercetari Veterinare si Biopreparate "Pasteur").

APPROVED FOR RELEASE: 06/15/2000 CIA-RDP86-00513R001342510010-4"

"Cases of Bovine Lymphadenosis."

Bucharest, Revista de Zootehnie si Medicina Veterinara, Vol 13, No 7, Jul 63, pp 76-81.

Abstract [Authors' English summary modified]: Describes 5 cases of lymphadenosis in cattle. Two different morphological pictures were observed: either hyperplasia of the spleen and lymphatic gland lymphoid tissue, or hyperplasia of the lymphoid tissue and lymphoid metaplasia of the mesenchymatose tissue of other organs, accompanied in some cases by a proliferating reaction of the glands and the spleen. Contains 7 figures and 10 references, of which 8 Western.

RUMANIA/Cultivated Plants - Fodders. M

Abs Jour : Ref Zhur Biol., No 18, 1958, 82377

grass, fertilizer N increased the C content by 50%. Fertilizer P did not increase the C content.

Card 2/2

EXCERPAT MEDICA Sec.12 Vol.11/10 Ophthalmology Oct57

POPOVICIU V.

1574. POPOVICIU V. * Arsurile oculare şi tratamentul lor actual cu o contribuţie personală la tratamentul conservativ. Eye burns and their present treatment (personal contribution) OFTALMOLOGIA (Bucureşti) 1956, 1/1 (86-89)

It was observed that injections of procaine HCl carried out from the start pericorneally, subconjunctivally and into the cul-de-sac, can replace all treatments. The effectiveness of the injections is due to the following facts: by suppressing the pain and the neurotrophic reflex, the inflammatory process and corneal disturb-

1972 CONT.

ances are prevented, cure being produced in a short time. Injections of 0.5-1% should be made every day. In severe cases, excision of the necrotic tissue with grafts of buccal mucosa and non-perforating keratoplasty are indicated.

Puscariu - Bucharest

MUSTATA, Leonard; DANULESCU, Irina; POPOVICI, Veronica

Maximum flow of the rivers from the southern part of Rumania in 1955; formation conditions. Studii hidrol 3:3-14 '62.

GAJZAGO, Laszlo; POPOVICS, Ivanne

Experiments for measuring with thermistor the surface temperature of various road pavements. Idojaras 64 no.3:175-177 My-Je '61.

GAJZAGO, Laszlo; POPOVICS, Ivanne

Experiments for the determination of areas of heat sensitiveness. (EEAI 10:1)
Idojaras 64 no.3:170-174 My-Je '60.
(Atmospheric temperature)

Popovics, S.

HUNG

116. The evaluation of concrete block tests conducted by the Qualifying Laboratory of the Institute of Building Science in 1952–53 — *Az 1952. évben illetve 1953. I. félévben az ÉTI. minősítő Laboratóriuma által végzett betonkocka vizsgálatok kiértékelése* — S. Popovics and J. Ujhelyi. (Hungarian Building Industry — *Magyar Építőipar* — Vol. 2, 1953, No. 12, pp. 389–394, 5 tabs.)

The results of compression tests conducted on concrete blocks taken at various construction sites were treated by methods of mathematical statistics. The distribution of the strength of concrete samples of identical composition of average strength and dispersion are given. It could be established that the strength properties usually follow a normal dispersion. The data on average strength proved that in most cases concrete strength was either significantly above or below the strength stipulated by the estimates. This may be attributed to the inadequate composition of the concrete since substantial quantities of cement could have been economized if the prescriptions had been adhered to. The dispersion of the strength data ranged between 12 to 25% of the average values. The article offers suggestions for eliminating the faults.

POPOVICS, S

Popovics, S. ; Ujhelyi, J. " The Results of Research on Cement in 1952" p. 315
(Epitoanyag, Vol. 5, No. 10, October, 1953, Budapest)

SO: Monthly List of East European Accessions, Library of Congress, March 1954, Uncl. Vol. 3, No. 3

Popovics S.

73. Design problems of concrete mixtures (In English) —S. Popovics. (*Acta Technica Academiae Scientiarum Hungaricae* — Vol. 11, 1955, No. 1—2, pp. 85—98, 5 figs.)

A very simple formula, the results of which closely approximate actual values, has been elaborated for obtaining the required amount of water when using Danube sandy gravel. An index method ensuring the specified consistencies is treated theoretically and proof is furnished of the existence of parabolic and hyperbolic relationships between the index of consistency and the water-cement ratio when using the usual means of measurement. The composition of the concrete mix and the grade of cement required for obtaining the specified concrete strength at a minimum cost and given consistency can be obtained by an approximating method of calculation. This also proves that cements of lower standard strength have their particular fields of application.

POPOVICS, S.

84. On the numerical characterization of the grain size of concrete aggregates. (In German) S. Popovics. *Acta Technica Academiae Scientiarum Hungaricae*, Vol. 13, 1955, No. 1--2p, p. 93--112, 12 figs., 3 tabs.

The paper presents the following closed formula for the Abrams modulus of fineness:

$$30 - 1.m = 100 \log 10.D - 0.343 \int_{0.1}^{D} \frac{f(d)}{d} \, dd$$

where m = the Abrams modulus of fineness, D = max. grain size in mm, $f(d)$ = the equation of grain structure. Logarithms are to the base ten. By demonstrating that the modulus of fineness is a characteristic value of the logarithm of average grain size and that the specific surface is a characteristic value of the divergence of distribution, evidence is produced that in general the modulus of fineness in itself presents a reliable basis for the estimation of continuous grain structures only, particularly so since as a consequence of continuity the necessary degree of divergence is usually ensured. For stepped grain structures it is necessary to introduce a new numerical characteristic of the grain structure, the so-called specific fictive surface. Subsequently the paper presents a numerical and a graphic method for determining the specific fictive surface. Finally experimental results are presented.

POPOVICS, SANDOR

HUNGARY/Chemical Technology. Chemical Products and Their Application - Silicates. Glass. Ceramics. Binders. I-9

Abs Jour : Referat Zhur - Khimiya, No 4, 1957, 12685

Author : Popovics Sandor
Title : Problems Pertaining to Computation of the Composition of Concrete

Orig Pub : Feladatok a betontervezes korebol. Magyar tud. akad. Musz tud. oszt. kozl., 1955, 15, No 1-4, 261-277 (Hungarian)

Abstract : Analyzed is the interrelationship between water:cement ratio, consistency, strength and composition of concrete. A formula is provided for the determination of water:cement ratio for concrete of rigid and plastic consistency:

$$(\text{Water:Cement})_{\text{Rigid}} = (60/C)\left[(3f + d) / 100 + 1.40\right] + 0.10$$

$$(\text{Water:Cement})_{\text{Plastic}} = 1.20\ (\text{Water:Cement})_{\text{Rigid}}$$

Card 1/2

POPOVICS, S.; UJHELYI, J.

POPOVICS, S.; UJHELYI, J. Methods of investigating the solidity of concrete. p. 336.

Vol. 8, No. 9, Sept. 1956.
EPITOANYAG
TECHNOLOGY
Budapest, Hungary

So: East European Accession, Vol. 6, No. 2, Feb. 1957

POPOVICSNE GUBOLA, Maria

Biometeorological research in Poland. Idojaras 67 no.3:172-173 My-Je '63.

PÓPOVICSNE GUBOLA, Maria

Daily variations of equivalent temperature in Budapest. Idojaras 67 no.4:242-243 Jl-Ag '63.

POPOVICSNE GUBOLA, Maria

Sultry weather conditions in Budapest. Orsz meteor int besz tud kut 26:268-278 '62(publ.'63).

POPOVICSNE, G.M.

Division of Medical Meteorology, Hungarian Meteorological Society. Idojaras 68 no.1:64 Ja-F '64.

GAJZAGO, Laszlo; POPOVICSNE GUBOLA, Maria

Formation of the cooling values during the daily hours in the summer. Orsz meteor int besz tud kut 25:286-287 '61 (publ.'62).

GAJZAGO, Laszlo; POPOVICSNE GUBOLA, Maria

An experiment for the establishment of temperature sensation ranges. Orsz meteor int kiss tud kut 25:288-290 '61 (publ.'62).

GAJZAGO, Laszlo; POPOVICSNE GUBOLA, Maria

Biometeorological data on Heviz. Orsz meteor int besz tud kut 25:373 '61 (publ.'62).

DJAJA, Milutin; POPOVIE, Sreten

A case of echinococcosis of the spleen in a 12-year old girl.
Med. pregl., Novi Sad 8 no.4:246-249 1955.

1. Decja hirurska klinika Medicinskog fakulteta Beograd.
Upravnik: prof. dr. Dimitrije Jovcic.
(ECHINOCOCCOSIS,
spleen in child, surg., splenectomy (Ser))
(SPLEEN, dis.
echinococcosis, surg., splenectomy in child (Ser))

Card : 1/1

POPOVIN, V.S.; KORNEV, A.M.

Efficient methods of designing apparatus for deep prospecting drilling for oil and gas. Razved. i okh. nedr 28 no.9:45-48 S '62. (MIRA 15:9)

1. Ministerstvo geologii i okhrany nedr SSSR (for Popovin).
2. Moskovskiy institut neftekhimicheskoy i gazovoy promyshlennosti im. akad.Gubkina (for Kornev).
(Boring machinery)

POPOVIN, V.S.; APANOVICH, Yu.G.

Drilling the Aralsor well. Razved. i okh. nedr 29 no.5:56 My '63. (MIRA 16:7)

1. Gosudarstvennyy geologicheskiy komitet SSSR (for Popovin).
2. Nachal'nik Aralsorskoy ekspeditsii (for Apanovich).
(Caspian lowland—Boring)

POPOVIN, V.V.

Prospecting for oil pools in the terrigenous sediments of the Devonian in the southwestern sector of the Udmurt A.S.S.R. Neftegaz. geol. i geofiz. no.9:30-32 '64. (MIRA 17:11)

1. Vsesoyuznyy nauchno-issledovatel'skiy geologorazvedochnyy neftyanoy institut, Moskva.

POPOVIN, V.V.

Distribution of the Devonian terrigenous layer in the north-eastern slope of the Tatar Arch and adjacent regions. Geol. nefti i gaza 7 no.2:15-21 F '63. (MIRA 16:2)

1. Vsesoyuznyy nauchno-issledovatel'skiy geologorazvedochnyy neftyanoy institut, Moskva.
(Tatar A.S.S.R.--Petroleum geology)
(Tatar A.S.S.R.--Gas, Natural--Geology)

MISHURIS, I., inzh.; POPOVKIN, A., ekonomist

Polymers in construction. Zhil. stroi. no.10:16-18 '64.
(MIRA 18:4)

PIGULEVSKIY, Sergey Viktorovich; POPOVKIN, Aleksandr Petrovich; TOVSTOLUZHSKIY, N.I., inzh., retsenzent; GONCHAROV, A.F., inzh., retsenzent; KIMMEL', L.S., red.izd-va; GRECHISHCHEVA, V.I., tekhn. red.

[Construction and maintenance of 750 mm-gauge logging railroads] Ustroistvo i soderzhanie lesovoznykh zheleznykh dorog kolei 750 mm. Moskva, Goslesbumizdat, 1963. 224 p. (MIRA 17:3)

POPOVKIN, B.A.; STMANOV, Yu.P. [deceased]

X-ray study of basic lead selenates and selenites. Zhur. neorg. khim. 10 no.7:1636-1641 Jl '65. (MIRA 18:8)

L 38929-66 EWA(m)/EWP(j)/EWP(t)/ETI IJP(c) WW/JG JD/HM

ACC NR: AP6011659 SOURCE CODE: UR/0020/66/167/003/0604/0606

AUTHOR: Turova, N. Ya.; Popovkin, B. A.; Novoselova, A. V. (corresponding member AN SSSR)

ORG: Moscow State University im. M. V. Lomonosov (Moskovskiy gosudarstvennyy universitet)

TITLE: X-ray analysis of methylates of alkali-earth metals

SOURCE: AN SSSR. Doklady, v. 167, no. 3, 1966, 604-606

TOPIC TAGS: X ray analysis, beryllium, magnesium, calcium, strontium, barium

ABSTRACT: The authors made an x-ray analysis of methylates of Be, Mg, Ca, Sr, and Ba in the form of powder products obtained upon desolvation of Me $(OCH_3)_2 \cdot 4\ CH_3OH$ (Me = Mg, Ba) or in the form of unsolvated alcoholates. The x-ray patterns of the powder were obtained on Fe-K-radiation in an RKD-57.3 camera.[10] The parameters were refined on the basis of the powder patterns recorded on CuKα-radiation with the use of a monochromatic illuminator. The specimens of the alcholates for photographing in the RKD camera were prepared by filling capillary tubes made of pyrex glass in a dry chamber in an argon atmosphere. Suspensions of powders in absolute liquid petrolatum were used for recording in the monochromator. The

Card 1/3 UDC: 546.4/.5+548.736

ACC NR: AP6011659

density was determined pycnometrically and by the suspension method in mixtures of absolute benzene with CCl_4 or $CHBr_3$ with preliminary pressing of the powders in a vacuum. Both methods yielded results which agreed well. The quality of the x-ray patterns of the alkali-earth methylates somewhat deteriorates upon changing from strontium to calcium, only diffuse rings were present on the powder x-ray patterns of Mg $(OCH_3)_2$, and Be $(OCH_3)_2$ represented a completely x-ray amorphous substance. The x-ray patterns of Ca $(OCH_3)_2$, Sr $(OCH_3)_2$, Ba $(OCH_3)_2$ were fully identified in the hexagonal cells. On the basis of the coincidence of the indexes of the lines of the powder x-ray patterns of Ca $(OH)_2$ and of the methylates, their sequence, and the relative intensity, the authors conclude that all alkali-earth methylates are isostructural to calcium hydroxide and have the same space group $P\bar{3}ml$ ($C\bar{3}m$). These methylates apparently have a laminar structure with the following alternation (in the direction of the c-axis) of atoms: [(CH_3)OmeO(CH_3)] [(CH_3)OMe.... each of these atoms forms a layer perpendicular to the c-axis. This structure of the methylates is confirmed by the difference of the parameters of c in hexagonal cells of Ca $(OCH_3)_2$ and Ca $(OH)_2$ amounting to 3.44 A, which is very close to the difference between the heights of the cells of $LiOCH_3$ and LiOH (3.55 A). The constancy of the heights of the unit cells which was observed upon transition from Ca $(OCH_3)_2$ to Ba $(OCH_3)_2$ is attributed to the rather sharp increase of the degree of ionization of the metal-oxygen bond from the former to the latter compensating the increase of the radius of the metal. The same constancy of heights is observed in the methylates of lithium and sodium and for Na $(OCH_3)_{0.66}$ $(OH)_{0.33}$ and $KOCH_3$. Orig. art. has:

L 38929-66

ACC NR: AP6011659

1 table.

SUB CODE: 07,11 SUBM DATE: 09Sep65/ ORIG REF: 003/ OTH REF: 010

Card 3/3

POPOVKIN, B.A.; CHEREMISINOV, V.P.; SIMANOV, Yu.P. [deceased]

Crystal structure and vibrational spectrum of lead selenite. Zhur. strukt.khim. 4 no.1:43-49 Ja-F '63. (MIRA 16:2)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.
(Lead selenite crystals—Absorption spectra)

POPOVKIN, B.A.; CHEREMISINOV, V.P.; SIMANOV, Yu.P. [deceased]

Crystal structure and vibrational spectrum of lead selenite. Zhur.strukt.khim. 4 no.1:43-49 Ja-F '63. (MIRA 16:2)

1. Moskovskiy gosudarstvennyy universitet imeni M.V. Lomonosova.
(Lead selenite crystals—Absorption spectra)

POPOVKIN, B.A.; SIMANOV, Yu.P.

X-ray examination of two modifications of lead selenate. Zhur.neorg.khim. 7 no.7:1743-1746 Jl '62. (MIRA 16:3)
(Lead selenate) (X-ray crystallography)

POPOVKIN, B.A.; ODIN, I.N.; NOVOSELOVA, A.V.

Lead oxide - lead selenide system. Zhur.neorg.khim. 8 no.5: 1224-1227 My '63. (MIRA 16:5)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Lead oxides) (Lead selenides)

ZLOMANOV, V.P.; POPOVKIN, B.A.; TANANAYEVA, O.I.; NOVOSELOVA, A.V.

Some properties of lead selenite and oxyselenites. Zhur.neorg. khim. 7 no.12:2746-2751 D '62. (MIRA 16:2)

1. Moskovskiy gosudarstvennyy universitet imeni Lomonosova.
(Lead selenite)

L 17011-63 EWP(q)/EWT(m)/BDS AFFTC/ASD RDW/JD
S/078/63/008/005/014/021

58

AUTHOR: Popovkin, B. A., Odin, I. N. and Novoselova, A. V.

TITLE: A PbO - PbSe system

PERIODICAL: Zhurnal neorganicheskoy khimii, v. VIII, No. 5, May 1963, 1224-1227

TEXT: This work is a continuation of an investigation of chemical reaction in the trinary system leadseleneum-oxygen and of the fusion diagrams of individual sections of this system. The authors conclude from their experimental study that at temperatures up to 1100° PbSe definitely does not interact with PbO. On the basis of a thermal and X-ray analysis they construct a fusion diagram for a PbO - PbSe system. The system was of simple eutectic type, with fusion point at 760 ± 10° and 20 mol % PbSe. There are 2 figures and 2 tables.

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. Lomonosova (Moscow State University im. M. V. Lomonosov)

SUBMITTED: November 16, 1962

Card 1/1

POPOVKIN, B.A.; NOVOSELOVA, A.V.

Lead selenite - lead oxide system. Dokl. AN SSSR 139 no.1:117-119 Jl '61. (MIRA 14:7)

1. Moskovskiy gosudarstvennyy universitet im. M.V. Lomonosova.
2. Chlen-korrespondent AN SSSR (for Novoselova).
(Lead selenite) (Lead oxide)

152620

25482
S/020/61/139/001/014/018
B103/B226

AUTHORS: Popovkin, B. A. and Novoselova, A. V., Corresponding Member AS USSR

TITLE: Study of the system lead selenite - lead oxide

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 139, no. 1, 1961, 117 - 19

TEXT: The authors studied the system $PbSeO_3$ - PbO by thermal and X-ray phase analyses with a view to precisely defining composition and limits of existence of lead oxyselenites. The fact has been proved earlier (B. A. Popovkin et al. Ref. 1: DAN, 129, No. 4, 809 (1959)), that only lead selenite is produced by the interaction between lead selenide and oxygen at 500-600°C. The authors prepared mixtures of analytical-grade products ЧДа(ch, d, a) consisting of yellow lead oxide and lead selenite, the latter of which has been produced of analytical-grade selenious acid and lead nitrate. For conducting the thermal analysis, carefully pulverized and mixed samples were prepared by annealing in evacuated quartz ampoules. Equilibrium mixtures with less than 70 mole % PbO required a 20-hr annealing at 560-570°C,

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those with a higher PbO content - 40 hr at 630-650°C. The ПК-52 (PK-52) pyrometer with platinum-platinum rhodium thermocouples by N. S. Kurnakov served for the differential thermal analysis. Al_2O_3 was taken as a standard. Weighed portions of 0.8 g were heated in platinum crucibles. Average heating rate was 10-12°C/min (in individual cases 5-6°C/min); heating curves were recorded. X-ray diagrams were recorded by the powder method. Fe-K radiation in РКД (RKD) cameras, or, at high temperatures, the "УНИКАМ" (Unikam) camera served for the purpose. Capillaries of "Pyrex" glass contained the substance. The intensity of the lines was visually evaluated according to a 5-stage scale. Fig. 1 shows the phase diagram of the $PbSeO_3$ - PbO system; Fig. 2 the results of X-ray phase analysis. The melting points of $PbSeO_3$ at 680°C and of PbO at 885°C were determined. The presence of oxyselenite: A) $2\,PbO \cdot PbSeO_3$, and B) $4\,PbO \cdot PbSeO_3$ was proved in the system (in accordance with Ref. 1). A) melts with decomposing at 755°C: $2PbO \cdot PbSeO_3 \rightleftarrows$ melt + $4PbO \cdot PbSeO_3$, and with lead selenite forms a eutectic at 605°C and 33.3 mole % PbO. B) melts congruently at 805°C and with PbO forms a eutectic

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(800°C, 83.3 mole % PbO). In addition to effects unambiguously belonging to decomposition or to melting of the phases mentioned, others were recorded in thermal analysis that cannot clearly be interpreted: between 45 and 63 mole % PbO when heating with 5-6°C/min, endothermic effects (625, 650, and 710°C) became visible. When heating with 10-12°C/min, these effects did not appear on the curves or were only indicated by small breaks. With slow heating, the temperatures of the final melting of mixtures with 55 and 60 mole % PbO decrease from 750 and 755°C to 730°C. The eutectic effect (605°C) in each case appears independently of the heating rate. According to the authors' assumption, these unclear effects can be exerted by the formation and conversions of the unstable oxyselenite $PbSeO_3 \cdot PbO$. Mixtures with 5 to 20 mole % PbO showed a reversible endothermic effect at 625°C being absent in the thermograms of pure lead selenite. The Debye powder pattern of the sample with 95 mole % $PbSeO_3$ and 5 % PbO annealed at 640°C, showed some lines neither belonging to $PbSeO_3$ nor to $2\,PbO \cdot PbSeO_3$. The authors assume that this effect is related to the reversible polymorphous

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conversion of lead selenite which is stablized by $2PbO \cdot PbSeO_3$. Furthermore, this effect may be due to melting the eutectic of the $PbSeO_3 \cdot PbO$ compound with lead selenite assumed by the authors. The effects $275 \pm 10^{\circ}$ and $370 \pm 10^{\circ}C$ which are not always reproducible appear in mixtures with 25-75 mole %. They are independent of both the formation and decomposition of new crystalline phases; they possibly belong, however, to second-order conversions of $2PbO \cdot PbSeO_3$. The structure of the oxyselenites mentioned is identical with that of the crystalline phases being proved earlier (Ref.1) in the oxidation products of lead selenide. A) crystallizes in the tetragonal lattice with the parameters of the body-centered cell a = 3.92 kX, c = 5.37 kX; B) crystallizes in rhombic lattices with the parameters of the body-centered cell a = 3.92 kX, b = 3.73 kX, and c = 5.72 kX. There are 2 figures and 7 references: 4 Soviet-bloc and 3 non-Soviet-bloc. The two references to English-language publications read as follows: F. N. Pollard et al. (Ref. 4: Ann. Chem. Acta, 20, 26 (1959)); H. Lipson, A. Wilson, Ref. 7: J. Sci. Inst. 18, 144 (1955)).

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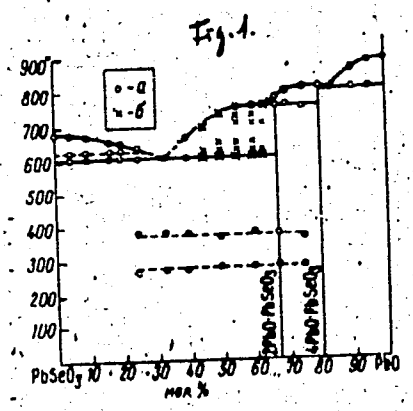
ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova (Moscow State University imeni M. V. Lomonosov)

SUBMITTED: April 6, 1961

Fig. 1.



Legend to Fig. 1: System $PbSeO_3$ - PbO. (а) heating rate 10-12°C/min, (б) the same 5-6°C/min. Abscissae - mole %.

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AUTHORS: Novoselova, A.V., Corresponding Member of the USSR Academy of Sciences, Pashinkin, A.S., Candidate of Chemical Sciences, Popovkin, B.A.

TITLE: On the Production of Particularly Pure Selenium and Tellurium

PERIODICAL: Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva im. D.I. Mendeleyeva, 1960, No. 5, Vol. 5, pp. 557-562

TEXT: Selenium, tellurium and also selenides and tellurides of certain metals are used in the production of semiconductors, rectifiers, valve-type photocells and sensitive electro-photographic layers, etc. Pure selenium is expected to be used in the future in the synthesis of other selenides for luminophors, photo-resistors, crystal counters, etc. The semiconductor properties of tellurium and tellurides are the subject of intensive studies. In the present article the authors describe and comment on the various methods developed for the production of pure selenium and tellurium from

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commercial products. It is mentioned that the technology of selenium and tellurium production from raw materials and their primary purification methods have been described in detail in Soviet literature (Ref. 1-4). The main raw material for selenium production are the by-products of non-ferrous metallurgy plants and of the sulfuric acid production. Commercial selenium contains usually up to 98.5 % of the basic substance and admixtures of tellurium, sulfur, oxygen, arsenic, phosphorus, chlorine, silicon, sodium, copper, silver, magnesium, cadmium, mercury, aluminum, tin, lead, antimony, bismuth, iron and nickel. Penin (Ref. 5) studied the effects of admixtures on the electrical properties of selenium rectifiers. It was found that the admixtures of many metals introduced in the form of selenides in relatively low concentrations (0.1-0.01 at. %) cause a weakening of the rectifying action of the rectifiers. Copper and nickel were found to cause a decrease of the rectification coefficient. Abdullayev and Shapiro (Ref. 7, 8) found that the introduction of halides (up to 0.15%) and thallium improve the

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rectification characteristics. Other Soviet authors, such as Putseyko (Ref. 9), Kozlovskiy (Ref. 10), Luk'yanov (Ref. 11) and Nasledov (Ref. 12) dealt with the effects of admixtures on the photosensitivity of selenium photocells. The effects of non-metallic and metallic admixtures on the conductivity of selenium were investigated in Ref. 13-15. Foreign admixtures in selenium were found to affect the rate of crystallization of the latter. Alkaline metals, halogens, tellurium and thallium increase the rate of crystallization (Ref. 16, 17). The volatility of selenium is used in its purification and in the purification of its compounds (peroxides, halides). Other factors used in this connection are the high solubility of selenious acid, ease of reduction of its compounds to elementary selenium, the ability of selenium, contrary to tellurium, to form various addition products, which decompose under certain conditions forming pure selenium. Other methods are connected with the oxidation of commercial selenium, purification of the obtained peroxide and reduction to elementary selenium. The oxidation of commercial selenium to peroxide with subsequent sublimation was recommended by

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Lobanov and Tabunin (Ref. 20, 22). In Ref. 23 Alekseyev reports that by a single distillation of selenium peroxide containing 10% of admixtures at 400°C a product can be obtained containing admixtures of iron 0.0003%, nickel 0.00003%, copper 0.0002%. Purification of selenium peroxide from admixtures of heavy metals is carried out by precipitation of these from the solutions of selenious acid in the form of selenites. This method is also recommended for purification from tellurium, the peroxide of which is very poorly soluble in water (Ref. 24). It is suggested that selenious acid should be purified by using ion-exchange resins instead of the method recommended in Ref. 25-28, which involves the coprecipitation of admixtures with aluminum hydroxide or iron hydroxide, leading to a significant drop in the admixture content of arsenic, antimony, lead, titanium, manganese and silver, but causing a certain pollution by iron and aluminum. By distilling a solution of selenious acid at 330°C a separation of selenium peroxide from admixtures of tellurium, iron, aluminum, magnesium, silicon, mercury and arsenic can be accomplished after oxidizing it to a pentavalent state (Ref.21).

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One of the simplest methods for reducing the purified selenium peroxide is the reduction with sulfur dioxide in a hydrochloric acid solution. Other reducing agents used are formic acid, ammonium sulfide, hydrazine and its derivatives. The tendency of selenium to addition reactions is used in producing pure selenium. Commercial selenium dissolves in solutions of cyanide, sulfide or sodium sulfite when heated, or in concentrated sulfuric acid with the following reactions taking place:

$$Se + KCN \longrightarrow KCNSe$$
$$Se + Na_2S \longrightarrow Na_2SSe$$
$$Se + Na_2SO_3 \longrightarrow Na_2SeSO_3$$
$$Se + H_2SO_4 \longrightarrow SeSO_3 + H_2O$$

Pure selenium is then produced by dissolving or solidifying the resultant solutions. The sulfite-cyclic method for the production of pure selenium is one of the most widely used in the Soviet Union (Ref. 34, 35). Other methods recommended are based on the chlorination of selenium with subsequent hydrolysis of the chloride in the gaseous phase with water vapors (Ref. 36) and by thermal decomposition of hydrogen selenide (Ref. 37). The latter method is

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based on the different tendencies toward hydration of selenium and the admixture elements and the different thermal stability of selenium hydride and the hydrides of the other elements which are formed. Methods involving sublimation and distillation are widely used as methods for purifying selenium (Ref. 14, 37-40). The behavior of the different admixtures in the sublimation process was studied in a number of works (Ref. 37, 39, 42). An investigation was conducted of the distribution of the admixtures of sulfur, thallium and mercury in the zones of condensation during the evaporation of selenium at 200-275°C. It was found that at 250°C the thallium admixture hardly volatilizes at all with selenium, but at 275°C, in addition to selenium, thallium starts volatilizing noticeably. It is pointed out here that the presence of mixed molecules of sulfur and selenium in the gaseous phase is a great obstacle in the purification of selenium from sulfur admixtures at low temperatures (Ref. 43). Vacuum distillation was found to have little effect in the purification of selenium from mercury admixtures (Ref. 42).

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It is suggested to heat selenium in evacuated ampoules at 700°C with subsequent sharp cooling in order to purify it of oxygen (Ref. 40). Pure selenium was obtained in this way with a specific resistance in the order of 10^{-8} ohm·cm. Distillation with a fractionating column was also used for the same purpose. Zonal liquefaction for purifying selenium has proven unsuccessful due to severe overcooling of the liquid selenium and solidification of it into the vitreous state (Ref. 36). Kozyrev (Ref. 47) pointed out that purification by the zonal liquefaction method can give positive results under high pressure. In the latter case the rate of crystallization is said to increase. In referring to the methods for producing pure tellurium the following facts are listed: the raw-materials used are by-products of the non-ferrous metallurgy, particularly electrolyte copper slurry. Commercial tellurium usually contains 95-99 % of the basic substance with a great deal of admixtures of tellurium peroxide, selenium, sulfur, chlorine, sodium, copper, silver, lead, bismuth, etc. The latter are in the bound state, forming tellurides, oxides, chlorides. An admixture of selenium forms a solid solution with tellurium. Pure tellurium is used in the semiconductor

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industry for the production of alloys with optimum thermo-electrical properties. The works of Ref. 48-53 are dedicated to the study of the effect of various admixtures and activating additions on the thermoelectrical properties of the alloys. Lead and tin are the most undesirable admixtures in tellurium. Methods for its purification are physical and chemical in nature or a combination of both. The chemical methods are based on the recrystallization or reprecipitation of tellurium and its compounds. Reduction potentials of tetravalent tellurium and selenium are different and depend on the acidity of the medium (Ref. 29, 54, 46). It was shown recently that this method is unsuitable for separating out small admixtures of selenium. Tellurium can be purified of heavy metals and selenium by applying the properties of the amphoteric nature of the tellurium peroxide and its low solubility (Ref. 24). Tellurium peroxide is purified of iron or heavy metals by being dissolved in sodium hydroxide. At a pH ~ 10 precipitation of the hydroxide or that of the tellurites of various compositions is accomplished (Ref. 56, 57). Solovushkov discusses in Ref. 55 the means by

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which tellurium peroxide can be purified of copper, magnesium, aluminum, lead, antimony, bismuth, viz., using the low solubility of tellurium peroxide in nitric acid. The purification of tellurium by recrystallization of the compounds is used more rarely than other methods at the present time (Ref. 59, 60). Tellurium can be purified of selenium and sulfur admixtures by melting with potassium cyanide (Ref. 64). The physical methods of purification are considered: the sublimation and distillation of metallic tellurium in a vacuum, distillation in a flow of hydrogen or of an inert gas, distillation of tellurium compounds, zonal liquefaction and directed crystallization (Ref. 58, 65, 66). A study of the admixture behavior in vacuum distillation has revealed that the chloride admixtures condense in the colder sections of the zone of condensation (Ref. 66, 68) and their content in the main zone of condensation can be reduced (Ref. 68) by 300-400 times. The author has established that the selenium admixture in tellurium, both in sublimation and distillation, condenses actually together with tellurium (Ref. 70). It is recommended that tellurium be chemically purified prior to

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vacuum sublimation, in order to eliminate the selenium admixture. However, the authors doubt the need for eliminating the selenium admixture in the case of semiconductor manufacture. Sublimation in a hydrogen or inert gas flow is another effective method suggested for purifying tellurium (Ref. 71-73). The sublimation and distillation of tellurium compounds, like tetra-chloride and peroxide, have only a limited significance (Ref. 60, 75, 77). A high difference in the vapor pressure of the selenium peroxide and the tellurium peroxide could be used for separating tellurium from selenium admixtures (Ref. 78). Due to the complexity of the apparatus needed the recently suggested method of tellurium purification based on the thermal dissociation of tellurium hydride is unpractical. Besides, the latter method would give a low yield of the pure product, viz., 24 % and less (Ref. 79). Tellurium is subjected to zonal liquefaction when it is necessary to have a product of the highest purity. This is necessary for research purposes (Ref. 83). Zonal liquefaction is uneffective in the case of eliminating selenium and magnesium admixtures (Ref. 46, 80). The direct crystallization

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method is simple but not very effective when purifying tellurium from admixtures in the order of 0.001 at.% (Ref. 63) and selenium admixtures. In conclusion the authors point out that a summary of all the existing methods of purification both in the Soviet Union and other countries has shown that the purest samples of these elements can be obtained by the combination of physical and chemical methods of purification under the condition that the physical methods are used in the last stage. There is 1 table and 83 references: 54 are Soviet, 9 German, 20 English.

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NOVOSELOVA, A. V.; PASINKIN, A. S.[Pashinkin, A. S.]; POPOVKIN, B. A.

Preparation of the highly pure selenium and tellurium. Analele chimie 16 no.3:98-107 Jl-S '61.

(Selenium) (Tellurium)

NOVOSELOVA, A.V.; PASHINKIN, A.S., kand.khimicheskikh nauk; POPOVKIN, B.A.

Preparation of highly pure selenium and tellurium. Zhur. VKHO 5 no. 5:557-562 '60. (MIRA 13:12)

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(Selenium) (Tellurium)