

USSR

BALABANKIN, V. Ye., et al., Elektron. tekhnika. Nauchno-tekhn. sb. Elektron SVCh 1970, Issue 9, pp 110-116 (from RZh--Elektronika i yeye primeneniye, No 1, Jan 1971, Abstract No 1A68)

800 ± 25°C after a total reduction in area of ~50%. The maximum gas evolution of the multilayer bands containing Ni with the addition of Ca and which is heated to 1000°C in a vacuum (pressure $\leq 10^{-6}$ mm mercury) for 20-30 min was observed at 800-850°C and did not exceed 4 cm³/100 g. Under identical conditions of test, bands containing nickel with the addition of strontium gave off the maximum quantity of gases at a temperature of 900-950°C. 5 ill. 4 tab. 9 ref. G. B.

2/2

USSR

UDC [621.357.035.4:621.79.027]:669.295.5(088.8)

KULESHOVA, T. V., and VOLYANSKAYA, Zh. V.

"Electrolyte for the Dimensional Electrochemical Treatment of Titanium Alloys"

USSR Author's Certificate No 324299, Filed 29 Dec 69, Published 7 Mar 72
(From Referativnyy Zhurnal -- Khimiya, No 21(II), 1972, Abstract No 21L287P
by A. D. Davydov)

Translation: An electrolyte composition is patented for the dimensional electrochemical treatment of Ti alloys containing (in %) 100 NaCl, 200 KNO₃, and 10 KBr. The electrolyte differs from other electrolytes by the presence of 50% NaNO₂, which improves the quality of treated surface at low D_A.

1/1

USSR

UDC [621.357:621.79.027]:621.165

KULESHOVA, T. V.

"Study of Electrochemical Machinability of Alloys Used in Turbine Building"

V sb. Novoye v elektrofiz. i elektrokhim. obrabotke materialov (What's New in Electrophysical and Electrochemical Treatment of Materials -- collection of works), Leningrad, Mashinostroyeniye Press, 1972, pp 29-31 (from RZh-Khimiya, No 12, Jun 72, Abstract No 12L302)

Translation: As a result of experimental selection of the electrolyte composition for electrochemical dimensional machining, it was established that for machining parts made of Kh18N9T stainless steel it is expedient to use solutions of a mixture of NaCl and NaNO_3 . To equalize the tolerance on the parts made of the same steel it is better to use a 10-15 percent solution of NaNO_3 . For electrochemical machining of parts made of EI-893 alloy, a 15% solution of Na_2SO_4 is recommended. The machining conditions are indicated for each case.

1/1

USSR

UDC 681.332.4

SHUBENKO, V. A., KULESSKIY, R. A.

"Device for Modeling Process of Amplitude Quantization"

USSR Author's Certificate No. 273534, Filed 21/04/69, Published 14/09/70
(Translated from Referativnyy Zhurnal Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No. 4, 1971, Abstract No. 4B134P).

Translation: The device suggested relates to analog computer modeling equipment and can be used to model digital control systems. A device for modeling the process of amplitude quantization is described in author's certificate No. 244731 in which the generator of the first derivative of the signal being quantized is connected to one of the inputs of an adder through an integrator with a relay element in the feedback circuit. The second input of the relay element is connected to a generator producing the first derivative of the signal to be quantized, and an uncontrolled diode element with a zone of insensitivity is connected between the output of the relay element and the input of the integrator. However, the accuracy of operation of this device during quantization of rapidly changing signals is not high due to the error in determination of the moment of disconnection of the relay element, since during the time required for the signal of the integrator to change by the value of one quantization step the signal being quantized changes by a certain degree. The device suggested differs from the

1/2

- 61 -

USSR

UDC 681.332.4

SHUBENKO, V. A., KULESSKIY, R. A., USSR Author's Certificate No. 273534, Filed 21/04/69, Published 14/09/70.

known device in that it includes a controlled diode element with a zone of insensitivity, the inputs of which are connected to the source of the input signal and to the output of the uncontrolled diode element with the zone of insensitivity, while the output is connected through a memory element consisting of an operational amplifier to the input of the relay element. These differences increase the accuracy of quantization of the input signal over a broad range of frequencies.
1 fig.

2/2

KULEVA, Z.P.

SPRS 59208
6.7

3

KI-7. SOLUBILITY OF CADMIUM TELLURIDE IN SOME METALS

[Article by I. K. Andronik, K. D. Sumbatyan, E. P. Kuzova, N. I. Kuznetsov, V. I. Kuznetsov, and V. I. Kuznetsov, *Zhurnal Fizicheskoi Khimii*, Moscow, 12-17 June 1977, p 133]

In order to obtain perfect crystals of the semiconductor ~~material~~, it is necessary to know the temperature dependence of the solubility of the semiconductor material in one solvent or another. For this purpose, the solubility of cadmium telluride in Cd and Cu was investigated.

A study was made in a quartz vessel of special design in an atmosphere of argon free of oxygen with a residual pressure of 50-100 mm Hg. The solution process was realized with saturation of the solvent with cadmium telluride was achieved at the corresponding temperature under the conditions of good solution.

The solubility data are presented in the table.

T, °C	100	200	300	400	500	600	650	700	750	800
$\frac{CdTe}{Cd}$	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015
$\frac{CdTe}{Cu}$	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015	0.0015

KULICHENKO, V.V.

23

JPRS 28764
17 April 1973

DISPOSAL OF RADIOACTIVE WASTES

Collection of Papers Sponsored by the State Committee for the Use of Atomic Energy of the USSR, 1972, Moscow

CONTENTS

	PAGE
Technical and Economic Aspects of Handling Liquid Waste with Intermediate and High Levels of Radioactivity (V. I. Spitsyn, et al.)	1
Study of the Possibility of Using Situmination for Processing Highly Active Waste (Z. P. Zakharenko, et al.)	14
Technical-Economic Comparison of the Methods of Solidification and Tank Storage for Highly Active Liquid Waste from the Processing of Spent Fuel Elements of Water-Cooled Vapor-Heated Power Reactors (L. G. Arzheyev, et al.)	36
Scientific Preparation for Burying Highly Active Liquid Waste in Deep Geological Formations (V. I. Spitsyn, et al.)	47
Development of Methods for Preparing the Wastes from Radioisotope Technology for Burial (M. V. Krylova, et al.)	62

(I - USSR - X)

DEVELOPMENT OF METHODS FOR PREPARING THE WASTES FROM HEXAFLUORIDE TECHNOLOGY
FOR REUSE.

Article by N. V. Kravtsov, V. V. Kulichenko, and Yu. P. Maryagin, State
Committee for the Use of Atomic Energy of the USSR, Moscow, 1972.
Publication Sp-163751, Moscow, 1972.

The development of anhydrous methods of the regeneration of nuclear
fuel has led to the appearance of a new type of waste. The hexafluoride
method of regeneration is based on the sublimation of volatile fluorides with
subsequent fractional distillation or adsorption for deep purification of the
uranium and plutonium of the other fission products (1-3).

As a result of the processing a series of wastes is formed of which
wastes from the fluorination apparatus presents the greatest hazard, as they
contain long-lived fission products (in the future they will be called fluorinator
wastes), and wastes containing easily volatile fluorides, trapped in the process
pending sorbents (Table II).

The fluorinator wastes are solid friable substances, containing a mixture
of the fluorides of long-lived fission products, including the radionuclides
cesium-137. Depending upon the technological standpoint--strontium-90 and
the ballast composition of the wastes may include aluminum, the fluorides of
iron and aluminum, etc.

The long half-life of cesium and strontium, the considerable activity
of cesium fluoride, the high specific activity of the wastes, and the 30-40
year period of their decay require a specially reliable burial for hundreds of
years. Fluorinator wastes upon completion of the process are transferred to
special tanks.

In connection with the high specific activity of wastes and the low
coefficient of thermal conductivity of the friable materials at the center of the

Table 1
Characteristics of Highly Active Waste from Fluoride Technology in
the Processing of Nuclear Fuel

(a) Designation of waste	(b) Operation in reactor	(c) Specific activity in Ci/liter	(d) Heat content in kcal/liter
(1) Uranium dioxide	600-5000 (2) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(2) Uranium dioxide	600-5000 (3) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(3) Uranium dioxide	600-5000 (4) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(4) Uranium dioxide	600-5000 (5) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(5) Uranium dioxide	600-5000 (6) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(6) Uranium dioxide	600-5000 (7) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(7) Uranium dioxide	600-5000 (8) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(8) Uranium dioxide	600-5000 (9) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(9) Uranium dioxide	600-5000 (10) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(10) Uranium dioxide	600-5000 (11) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(11) Uranium dioxide	600-5000 (12) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(12) Uranium dioxide	600-5000 (13) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(13) Uranium dioxide	600-5000 (14) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(14) Uranium dioxide	600-5000 (15) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(15) Uranium dioxide	600-5000 (16) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(16) Uranium dioxide	600-5000 (17) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(17) Uranium dioxide	600-5000 (18) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(18) Uranium dioxide	600-5000 (19) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(19) Uranium dioxide	600-5000 (20) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(20) Uranium dioxide	600-5000 (21) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(21) Uranium dioxide	600-5000 (22) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(22) Uranium dioxide	600-5000 (23) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(23) Uranium dioxide	600-5000 (24) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(24) Uranium dioxide	600-5000 (25) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(25) Uranium dioxide	600-5000 (26) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(26) Uranium dioxide	600-5000 (27) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(27) Uranium dioxide	600-5000 (28) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(28) Uranium dioxide	600-5000 (29) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(29) Uranium dioxide	600-5000 (30) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(30) Uranium dioxide	600-5000 (31) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(31) Uranium dioxide	600-5000 (32) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(32) Uranium dioxide	600-5000 (33) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(33) Uranium dioxide	600-5000 (34) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(34) Uranium dioxide	600-5000 (35) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(35) Uranium dioxide	600-5000 (36) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(36) Uranium dioxide	600-5000 (37) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(37) Uranium dioxide	600-5000 (38) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(38) Uranium dioxide	600-5000 (39) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(39) Uranium dioxide	600-5000 (40) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(40) Uranium dioxide	600-5000 (41) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(41) Uranium dioxide	600-5000 (42) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(42) Uranium dioxide	600-5000 (43) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(43) Uranium dioxide	600-5000 (44) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(44) Uranium dioxide	600-5000 (45) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(45) Uranium dioxide	600-5000 (46) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(46) Uranium dioxide	600-5000 (47) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(47) Uranium dioxide	600-5000 (48) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(48) Uranium dioxide	600-5000 (49) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(49) Uranium dioxide	600-5000 (50) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(50) Uranium dioxide	600-5000 (51) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(51) Uranium dioxide	600-5000 (52) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(52) Uranium dioxide	600-5000 (53) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(53) Uranium dioxide	600-5000 (54) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(54) Uranium dioxide	600-5000 (55) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(55) Uranium dioxide	600-5000 (56) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(56) Uranium dioxide	600-5000 (57) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(57) Uranium dioxide	600-5000 (58) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(58) Uranium dioxide	600-5000 (59) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(59) Uranium dioxide	600-5000 (60) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(60) Uranium dioxide	600-5000 (61) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(61) Uranium dioxide	600-5000 (62) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(62) Uranium dioxide	600-5000 (63) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(63) Uranium dioxide	600-5000 (64) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(64) Uranium dioxide	600-5000 (65) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(65) Uranium dioxide	600-5000 (66) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(66) Uranium dioxide	600-5000 (67) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(67) Uranium dioxide	600-5000 (68) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(68) Uranium dioxide	600-5000 (69) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(69) Uranium dioxide	600-5000 (70) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(70) Uranium dioxide	600-5000 (71) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(71) Uranium dioxide	600-5000 (72) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(72) Uranium dioxide	600-5000 (73) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(73) Uranium dioxide	600-5000 (74) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(74) Uranium dioxide	600-5000 (75) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(75) Uranium dioxide	600-5000 (76) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(76) Uranium dioxide	600-5000 (77) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(77) Uranium dioxide	600-5000 (78) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(78) Uranium dioxide	600-5000 (79) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(79) Uranium dioxide	600-5000 (80) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(80) Uranium dioxide	600-5000 (81) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(81) Uranium dioxide	600-5000 (82) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(82) Uranium dioxide	600-5000 (83) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(83) Uranium dioxide	600-5000 (84) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(84) Uranium dioxide	600-5000 (85) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(85) Uranium dioxide	600-5000 (86) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(86) Uranium dioxide	600-5000 (87) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(87) Uranium dioxide	600-5000 (88) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(88) Uranium dioxide	600-5000 (89) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(89) Uranium dioxide	600-5000 (90) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(90) Uranium dioxide	600-5000 (91) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(91) Uranium dioxide	600-5000 (92) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(92) Uranium dioxide	600-5000 (93) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(93) Uranium dioxide	600-5000 (94) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(94) Uranium dioxide	600-5000 (95) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(95) Uranium dioxide	600-5000 (96) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(96) Uranium dioxide	600-5000 (97) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(97) Uranium dioxide	600-5000 (98) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(98) Uranium dioxide	600-5000 (99) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵
(99) Uranium dioxide	600-5000 (100) Uranium dioxide	10 ⁴ - 10 ⁵	10 ⁴ - 10 ⁵

Key: a) type of waste; b) specific activity; c) volume composition; d) isotopes; e) fluorine waste (slightly volatile fluoride); f) 500-50,000 curies per liter; g) 29 years; h) 33 years; i) 285 days; j) rare earths; k) treated sorbents (mainly volatile fluorides); l) up to 30,000 curies per liter; m) 39 days; n) 55 days; o) 330 days.

Single settling reservoirs high temperatures may be developed because of the heat of radioactive decay (Table 2).

Table 2
Temperatures Developing in a Tank with a Diameter of 60 Centimeters
for Wastes with Various Specific Activities

Specific activity (curies per liter)	Temperatures at the center of a tank without forced heat removal (°C)
1330	435
2500	1350
5000	(2300)
13300	(6350)

n) The calculation was conducted for a single settling reservoir with heat transfer due to natural convection in an unlimited air volume.

KULICHEVKO, V.V.

Collection of papers sponsored by the State Committee for the use of atomic energy of the USSR, 1972. Moscow

DISPOSAL OF RADIOACTIVE WASTES

JPRS 58764
17 April 1973



CONTENTS	PAGE
Technical and Economic Aspects of Handling Liquid Waste With Intermediate and High Levels of Radioactivity (V. I. Spitsyn, et al.)	1
Study of the Possibility of Using Bituminization for Processing Highly Active Wastes (T. V. Zakharenko, et al.)	14
Technical-Economic Comparison of the Methods of Solidification and Tank Storage for Highly Active Liquid Waste from the Processing of Spent Fuel Elements of Water-Cooled Water-Moderated Power Reactors (G. G. Azharyeva, et al.)	36
Scientific Prerequisites for Burying Highly Active Liquid Waste in Deep Geological Formations (V. I. Spitsyn, et al.)	47
Development of Methods for Preparing the Wastes From Hexafluoride Technology for Burial (S. V. Kopylov, et al.)	62

[I - USSR - R]

STUDY OF THE POSSIBILITY OF USING BITUMINATION FOR PROTECTING RADIOACTIVE WASTES

Article by K. P. Zakharova, V. V. Kulyabskaya, Yu. P. Matyshev, L. A. Sobolev, and L. M. Prudnykh, State Committee for the Use of Atomic Energy of the USSR, IAEA publication SM-143 (1971, Moscow, 1972, Russian pp 1-24)

At the present time the problem of the possibility of increasing the permissible specific activity of wastes enclosed in bitumen is being raised more and more frequently.

Now already there is no doubt of the possibility of bitumination of wastes with a specific activity of up to 1 curie per liter. At the same time, works are known on the enclosure of wastes with a specific activity up to 100 curies per liter in bitumen *et cetera*.

The limiting value of the specific activity is determined by two factors: The radiation-chemical stability of the bitumen blocks and the possible ex- traction of the heat accumulated in the blocks due to the energy of radio- active decay.

1. Radiation-chemical stability of bitumens

An essential factor determining the conditions of the burial of blocks is a possible liberation of gaseous products of radiolysis.

For 9 years observations have been made of the change in the pressure in metals with bitumen blocks containing 60% bitumen Bim-III (condensed) and 40% sodium nitrate, and having a specific activity from 0.15 to 15.4 curies per liter with respect to strontium-90 (Figure 1). The liberation of gaseous products of radiolysis was observed in all the experiments after a pro- longed period of the process of gas absorption, accompanied by a decrease in the pressure in the metal. For a block with an activity of 0.15 curie

one liter of air after two years of storage the rate of gas liberation had increased to 1.5 and the pressure in the vessel then had increased. In order to determine the specific activity of ^{210}Po and ^{210}Pb a series of experiments was conducted with the following results: (1) The rate of gas liberation was proportional to the total dose of radiation of specimens in a specimen container and the holding of toward a radiation of specimens in a specimen container with a specific activity of 1.5 curies per kilogram. The beginning of the gas liberation was observed in the case of a specimen in a container with a specific activity of 1.5 curies per kilogram in noticeable considerably earlier than the above of a specific activity of 1.5 curies per kilogram. At the present time, specimens have been prepared in amounts of 100 mg on the basis of 21.5 and 21.0 curies per kilogram with respect to strontium-90 on the basis of 21.5 and 21.0 curies per kilogram (see Table 1). The volume of the specimens was 2.1 x 10⁻⁴ cm³. During the first forty days the absorption in the specimens was observed (Figure 2), after which the liberation began. After 150 days the pressure somewhat exceeded the pressure in the tank.

For pure bismuth-210 and two specimens based on it, irradiated in a Co-60 installation with a power of the dose of 2.1 x 10⁴ rad per hour, the composition of the gaseous phase formed as a result of radiolysis was determined (Table 1).

A comparison of these results with those obtained earlier (2) with a dose of absorbed energy of 7 x 10⁵ rad and a power of the dose of 2.9 x 10⁴ rad per hour demonstrated that the increase in the power of the dose and the dose of absorbed energy leads to an increase in the content of hydrogen and the appearance of methane, hydrocarbons of Group C₂ and carbon dioxide in the gaseous phase.

Simultaneously in all cases a decrease in the oxygen content in the gaseous phase, in comparison with the air ratio, was noted.

The presence of sodium nitrate in the specimen in the given case has no essential effect on the composition of the gaseous phase.

For determination of the nature of radiation changes in the bismuth and in bismuth preparations special investigations were conducted.

Specimens in the form of cylinders, the diameter and height of which amounted to 1.5-1.4 centimeters, were irradiated on a Co-60 installation with various powers of the dose, and in this case the total dose of absorbed energy was preserved practically constant. The irradiation was conducted in an atmosphere of air.

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AUTHOR--KULIK, L.O. *K*
COUNTRY OF INFO--USSR
SOURCE--ZHURNAL EKSPERIMENTAL'NOY I TEORETICHESKOY FIZIKI, 1970, VOL 58,
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CIRC ACCESSION NO--AP0120403
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PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0120403

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE POSSIBILITY IS CONSIDERED OF QUANTUM COHERENT EFFECTS APPEARING IN SUPERCONDUCTORS AT TEMPERATURES EXCEEDING THE CRITICAL SUPERCONDUCTING TRANSITION TEMPERATURE T_{SUBC} . IT IS SHOWN THAT IN A SUPERCONDUCTING RING LOCATED IN A STATIONARY MAGNETIC FIELD H AND POSSESSING A TEMPERATURE T GREATER THAN T_{SUBC} A CIRCULATING CURRENT IS INDUCED WITH PERIODICALLY VARIES AS A FUNCTION OF THE MAGNETIC FLUX Φ . THE CURRENT AMPLITUDE IS PROPORTIONAL TO THE SMALL PARAMETER ϵ PRIME NEGATIVE $-\chi$, WHERE L IS THE RING CIRCUMFERENCE AND $\chi(T)$ SIMILAR TO χ_0 SUBO-SQUARE ROOT $T_{SUBC} (T \text{ MINUS } T_{SUBC})$ IS THE TEMPERATURE DEPENDENT COHERENCE LENGTH. FACILITY:
 FIZIKO-TEKHNICHESKIY INSTITUT NIZKIKH TEMPERATUR IN SSSR.

UNCLASSIFIED

Corrosion

4

USSR

UDC: 621.791.855.3

MEDOVAR, B. I., MARTYN, V. N., CHEKOTOLO, L. V., VOSEVILOV, B. M., KULEV, G. B.,
POLTAVETS, A. V., KRAVETS, N. I., and GLOZMAN, L. P.

"Corrosion Resistance of Joints of EP668 Alloy in Nitrogen- and Sulfur-Containing Media"

Kiev, Avtomaticheskaya Svarka, No 11, Nov 70, pp 67-68

Abstract: A study was made of the corrosion resistance of high-chromium alloy Kh50NSV (EP668) and its welded joints in highly aggressive media involved in the production of sulfuric and nitric acids. It was found that EP668 alloy and its welded joints have a high corrosion resistance in media containing nitrogen oxides NO and NO₂, natural gas with air, H₂S, SO₂, CO₂, and HCN gases. In these media the maximum corrosion rate of the parent metal and its welds is 0.01 g/m²·hour. For comparison, tests were also conducted on the most extensively employed corrosion-resistant materials, including Kh16N10T, Kh16N12T (EP448), OKh21NGM2T (EP54), titanium, aluminum, and St.3 steel. Under similar conditions these materials exhibited intensive corrosion. EP668 alloy is also resistant in ammonium carbonate solutions (43% NH₃, 34% CO₂, 23% H₂O) at 100°C and a maximum pressure of 200 atm.

1/1

USSR

UDC 621.373:530.145.6

IVANOV, A. A., KULEV, V. A., POLKOVNIKOV, S. P.

"Calculating the Electric Field of a Six-Pole Capacitor with Variable Transverse Cross Section"

Materialy nauchno-tekhn. konferentsii. Leningr. elektrotekhn. in-t svyazi. Vyp. 2
(Materials of the Scientific and Technical Conference. Leningrad Electrotechnical Communications Institute. Vyp. 2), Leningrad, 1970, pp 1210-1215 (from RZh-Radiotekhnika, No 8, Aug 70, Abstract No 8 D190)

Translation: The intensity of the electric field in a sensor with a variable gap is calculated. The calculational results obtained permit calculation of the component intensities of the electric field and its modulus at any point of the selector. It is demonstrated that in the indicated selectors, a longitudinal component of the field intensity occurs. Nonuniformity of the field in the selector with a variable gap, which determines the effectiveness of sorting of the molecules, is greater than in selectors with a constant gap. On the basis of the electric field equations obtained, the equations of motion of the molecules in the selector can be compiled. The latter equations permit determination of the parameters of the molecular flux at the output of the selector.

1/1

1/2 026 UNCLASSIFIED PROCESSING DATE--18SEP70
TITLE--EFFECT OF TRINITROPHENYLATION OF MYOSIN ON THE ISOTOPIC EXCHANGE OF
OXYGEN IN THE MYOSIN ATP H SUB 2 PRIME 18 O SYSTEM -U-
AUTHOR--(03)-KULEVA, N.V., KARANDASHOV, E.A., PANTELEYEVA, N.S.

COUNTRY OF INFO--USSR *K*

SOURCE--BIOKIMIYA 1970, 35(1), 42-7

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--MUSCLE PHYSIOLOGY, ADENOSINE TRIPHOSPHATE, ORGANIC NITRO
COMPOUND, BENZENE DERIVATIVE, ORGANIC SULFUR COMPOUND, OXYGEN METABOLISM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--1984/0862

STEP NO--UR/0218/70/035/001/0042/0047

CIRC ACCESSION NO--AP0055562

UNCLASSIFIED

2/2 026

UNCLASSIFIED

PROCESSING DATE--18SEP70

CIRC ACCESSION NO--A0055562

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE BINDING OF FREE NHSUB2 GROUPS BY 2,4,6-TRINI-TROBENZENESULFONATE (TNBS) IN MYOSIN ATPASE INHIBITED, BY 40-70PERCENT, THE ISOTOPIC O EXCHANGE REACTION CATALYZED BY MYOSIN DURING ATP HYDROLYSIS. HOWEVER TNBS TREATMENT ACTIVATED ATPASE IN THE PRESENCE OF MGPRIME2 POSITIVE 5-9-FOLD, DEPENDING UPON THE NO. OF BOUND NHSUB2 GROUPS. THE TNBS EFFECT OF ISOTOPIC O EXCHANGE AND ATPASE ACTIVITY WAS SIMILAR TO THAT OF ACTIN. CONFORMATIONAL CHANGES IN THE ACTIVE CENTER OF MYOSIN MAY OCCUR DURING FORMATION OF TRINITROPHENYLATED RESIDUES.

UNCLASSIFIED

USSR

UDC: 621.373.806

DOBZHANSKIY, G. F., KULEVSKIY, L. A., SAVEL'YEV, A. D., SMIRNOV, V. V.

"Discrete Frequency Tuning of Emission on the Second Harmonic on a Lithium Iodate Crystal From a Carbon Monoxide Laser"

Kratkiye soobshch. po fiz. (Brief Reports on Physics), 1978, No 6, pp 13-17 (from RZh-Radiotekhnika, No 12, Dec 72, abstract No 120146 by A. E.)

Translation: The authors report on achieving emission on the second harmonic on a lithium niobate crystal with CO laser pumping. Rearrangement of the spectrum of the transformed emission is effected discretely in the 2.5-2.8 μm range by changing the angle between the optical axis and the direction of propagation of the emission on the fundamental frequency. The laser operates in the Q-switched mode. Switching is done by a reflecting wedge rotating at 125 Hz. Peak emission power on the second harmonic is 4 mW for a pulse duration of 2 μs . In the emission spectrum of the second harmonic, 2-3 lines are observed with effective conversion. By increasing the length of the crystal (5 μm or more) and reducing the divergence of pumping emission to 30' or less, it is possible to achieve effective conversion of emission in the spectral region of 0.01 μm and less, which corresponds to the individual lines of a CO laser.

1/1

- 82 -

USSR

DAVYDOV, A. A., KULEVSKIY, I. A., PROKHOROV, A. M., SAVEL'YEV, A. D., and SMIRNOV, V. V., Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR

"Parametric Oscillation of a CdSe Crystal With Pumping From a $\text{CaF}_2:\text{Dy}^{2+}$ Laser"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 15, No 12, 20 Jun 72, pp 725-727

Abstract: The authors report obtaining parametric oscillation for the first time of a CdSe semiconductor crystal. The parametric radiation wavelengths were 3.37 and 7.86 microns. The pumping source used was a Q-switched $\text{CaF}_2:\text{Dy}^{2+}$ crystal laser with a laser wavelength of 2.36 microns and a repetition rate of 1 Hz. The resonator of the parametric oscillator was formed by two plane-parallel dielectric mirrors applied to fluorite substrates. The authors thank YU. N. POLIVANOV for useful discussions.

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Crystals and Semiconductors

USSR

DOBRZHANSKIY, G. F., KITAYEVA, V. F., KULEVSKIY, L. A., POLIVANOV, YU. N.,
POLUEKTOV, S. N., PROKHOROV, A. M., SOBOLEV, N. N., PHYSICS Institute imeni
P. N. Lebedev of the Academy of Sciences USSR

"Spontaneous Parametric Radiation of the α -HIO₃ Crystal"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, No. 11,
5 Dec 70, pp 505-508

Abstract: The first observation of spontaneous parametric radiation in the biaxial crystal α -HIO₃ belonging to class 222 of the rhombic system is recorded. It is noted that if a crystal having quadratic nonlinearity is exposed to a laser beam, there is a probability of a laser photon with frequency ω_H spontaneously decaying into two photons: a photon of the signal frequency ω_1 and a photon of an additional frequency ω_2 so that

$$\omega_H = \omega_1 + \omega_2.$$

The frequencies of the spontaneous parametric radiation ω_1 and ω_2 are determined by the dispersion characteristics of the crystal, since the process is effective if

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USSR

DOBZHANSKIY, G. F., et al. Pis'ma v Zhurnal eksperimental'noy i teoreticheskoy fiziki, No. 11, 5 Dec 70, pp 505-508

the following condition is fulfilled:

$$k_H = k_1 + k_2,$$

where k_H , k_1 , and k_2 are the wave vectors of the pumping and of the signal and additional waves. The phenomenon is termed particularly interesting, since it is observed even at pumping powers too small to excite parametric generation, and in the absence of a resonator it can be used to obtain angular, temperature, and electrooptical curves of active media suitable for use in parametric generators of light. The α -HIO₃ crystal was transparent in the region 0.4-1.4 μ and had high nonlinear constants. No optical inhomogeneities were observed in the refractive index under the action of optical radiation of high power density, a feature very important in developing parametric generators of light. A continuous argon laser with wavelengths $\lambda_{H1} = 4880 \text{ \AA}$ and $\lambda_{H2} = 5145 \text{ \AA}$ with an output power of up to 1 W on each of the wavelengths was used for pumping. Parametric radiation arising in the crystal and polarized along the Y-axis was recorded in the direction of pumping propagation. Typical spectrograms of the spontaneous parametric radiation signal are given which illustrate the dependence of the signal frequency ω_1 on the direction of propagation of pumping in the crystal. It was noted that such crystals can be used as a material to produce both pulsed and continuous parametric generators tuned in the region 0.6-1.3 μ .

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USSR

ZHASYUA, I.K., ~~AKHYSKAY~~, PASHENIN, P.S., and MUKOMOLOV,
A.M., Physics Institute imeni P.N. Lebedev, Academy of Sciences,
USSR

"Application of Picosecond Ruby Laser Pulses for Measuring
Damping Time of the Luminescence Band of the First Phonon Re-
petition of exciton .. in Ods"

Moscow, Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 59,
No 2(e), 1970, pp 346-349

Abstract: The object of this paper was to determine experimen-
tally the attenuation time of a luminescence band in Ods gen-
erated as a result of radiation recombination of a single exci-
ton with a simultaneously emitted photon and one phonon. A
previously described ruby laser was used as a source of double-
optical phonon. A series of picosecond exci-
tation in Ods. The ruby laser generated a series of picosecond
pulses from which, by means of a special gate, a single pulse
was discriminated. The discriminated pulse was directed at the

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USSR

KRASYUK, I. K., et al., Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 59, No 2(8), 1970, pp 346-349

CdS sample mounted in a cryostat at a temperature of 77°K. The CdS luminescence induced by the ruby laser was directed at the ELU-F7 photomultiplier the electric signal from which was recorded by means of one of the beams of the DSR-02 high-speed oscillograph. The oscillograph also recorded, simultaneously, the generated radiation pulse, a portion of which was directed at a coaxial photoelement FEK-15. A portion of CdS radiation was focused on the slit of a ISP-51 spectrograph. By placing a proper filter before the photomultiplier it was possible to observe green radiation from CdS or a blue band of the first phonon repetition of exciton A. The experimental value of the attenuation time was 1.3 nanosec. It is concluded that the use of picosecond laser pulses for investigating relaxation processes in solids will make it possible to obtain a series of new data.

172 018 UNCLASSIFIED PROCESSING DATE--13NOV70
TITLE--QUANTUM THEORY OF GALVANOMAGNETIC PHENOMENA IN METALS AND
SEMICONDUCTORS. I. EXPANSION OF THE ELECTRICAL CONDUCTIVITY TENSOR IN
AUTHOR--(02)-KULEYEV, I.G., ZYRYANOV, P.S.
COUNTRY OF INFO--USSR K
SOURCE--FIZIKA METALLOV I METALLOVEDENIE, MAR, 1970, 29, (3), 484-495
DATE PUBLISHED----MAR 70
SUBJECT AREAS--ELECTRONICS AND ELECTRICAL ENGR., PHYSICS
TOPIC TAGS--GALVANOMAGNETIC EFFECT, SEMICONDUCTOR CONDUCTIVITY, MAGNETIC
FIELD
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3003/0675 STEP NO--UR/0126/70/029700 170484/0495
CIRC ACCESSION NO--AP0129970
UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--13NOV70

2/2 018

CIRC ACCESSION NO--AP0129840

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. AN EXPANSION OF THE ELECTRICAL CONDUCTIVITY TENSOR IN TERMS OF IMPURITY CONCENTRATIONS (I.E., THE NUMBER OF SCATTERING CENTRES) IS DERIVED FOR METALS AND SEMICONDUCTORS SITUATED IN A QUANTIZING MAGNETIC FIELD. THIS EXPANSION IS REQUIRED, IN PARTICULAR, WHEN ANALYSING THE QUANTUM OSCILLATION OF THE HALL EFFECT AND THERMO GALVANOMAGNETIC PHENOMENA IN MATERIALS HAVING EQUAL ELECTRON AND HOLE CONCENTRATIONS. A GENERAL THEORY FOR EXPANDING THE KINETIC COEFF. IN POWERS OF IMPURITY CONCENTRATION IS DEVELOPED; THIS FACILITATES THE CALCULATION OF THE TENSOR COMPONENTS TO AN ACCURACY LIMITED BY QUADRATIC TERMS IN IMPURITY CONCENTRATION.

UNCLASSIFIED

USSR

K

UDC 669.017:537.321.6

KULEYEV, I. G., Institute of Physics of Metals, Academy of Sciences USSR

"Quantum Theory of Galvanomagnetic Phenomena in Metals and Semiconductors;
Report II: Consideration of the Collision Broadening of Landau Levels"

Sverdlovsk, Fizika Metallov i Metallovedeniye, Vol 29, No 6, Jun 70, pp 1149-1159

Abstract: A calculation is made of the component of the tensor of electrical conductivity in a single electron approximation, taking into consideration collision broadening of the Landau levels, for metals and semiconductors in a quantum magnetic field. The elastic scattering of electrons on chaotically distributed scattering centers with a short-range potential is considered in the non-Born approximation. A method is proposed for the experimental determination of the width of the Landau level. The author thanks P. S. Zyryanov for conducting the work and V. I. Okulov for useful remarks.

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UDC 681.3.001:518.5

USSR

KULEYEV, I. F., NEMIROVSKIY, M. B., ROKHLIN, F. Z.

"One-Level Memory"

Tr. Kazan. aviats. in-ta (Works of Kazan' Aviation Institute), 1979, vyp. 104, pp 64-67 (from RZh-Avtomatika, Telemekhanika i vychislitel'naya tekhnika, No 2, Feb 71, Abstract No 2323)

Translation: The most common methods of constructing a single-level memory, distinguished from each other by the automatic memory allocation algorithm and the algorithm for organization of information exchange between the different memory stages based on analysis of use of the stages at preceding points in time, are described. It is pointed out that the known algorithms have a deficiency consisting in the fact that they are based either on use of a large amount of peripheral equipment or on the use of quite large auxiliary sub-routines. A procedure is proposed for organizing a single-level memory using an adaptive priority system requiring minimum equipment expenditures. The program for solution of any problem is subdivided into a series of sequences of commands and numbers called "books". Part of the program is entered in the ready-access memory of the digital computer and is called the "book stack", and the unplaced part of the program is entered in an external memory. The books
1/2

- 68 -

USSR

KULEYEV, KH. F., et al., Tr. Kazan. aviats. in-ta (Works of Kazan' Aviation Institute), 1970, vyp. 104, pp 64-67

forming a stack are assigned so-called priority numbers beginning at the top of the stack. The high-order part of the addresses of the words making up a given book is called the "label." The memory location where the part of the program with the required word is located is defined by these labels. If the required book is in ready-access memory, then after extraction of it, it is assigned a priority number 1, and the priority numbers of the higher-lying books are incremented by one. If the required book is not present in ready-access memory, then the book with the highest priority number is sent from ready-access memory to the external memory, and the required book replaces it in ready-access memory with assignment of the priority number 1 to it. There is 1 illustration and a 3-entry bibliography.

2/2

USSR

UDC 681.3.001:518.5

KOBCHIKOV, A. V., KULEYEV, KH. F., OZHIGANOV, L. I.

"Two Implementations of the Tabular-Analytical Method of Calculating Functions"

Tr. Kazan. aviats. in-ta (Works of Kazan' Aviation Institute), 1970, vyp. 104, pp 59-63 (from RZh-Avtomatika, Telemekhanika i vychislitel'naya tekhnika, No 2, Feb 71, Abstract No 2535)

Translation: The possibilities of using the method of tabular-analytical representation of functions in digital computers are discussed. Here, the function $y = f(x)$ is represented in the form $y = \varphi(x) + \delta(x)$; where $\varphi(x)$ is an approximating function sufficiently simply calculatable or obtainable schematically, and $\delta(x)$ is the correction function stored in the long-term memory in the form of correction tables. There are 2 illustrations, 1 table, and a 3-entry bibliography.

1/1

1/2 032 UNCLASSIFIED PROCESSING DATE--27NOV70
 TITLE--SURFACE MAGNETO ACOUSTIC PHENOMENA IN METALS AND FERRO DIELECTRICS
 -U-
 AUTHOR--(02)-VLASOV, K.V., KULEYEV, V.G.
 COUNTRY OF INFO--USSR
 SOURCE--FIZIKA TVERDUGO TELA, APR. 1970, 12, (4), 1099-1108
 DATE PUBLISHED-----70
 SUBJECT AREAS--PHYSICS, MATERIALS
 TOPIC TAGS--MAGNETOACOUSTIC EFFECT, ULTRASONIC WAVE PROPAGATION, MAGNETIC POLARIZATION, RARE EARTH METAL, FERROELECTRIC MATERIAL
 CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAME--3002/1807 STEP NO--UR/0181/75/012/004/1099/1108
 CIRC ACCESSION NO--AP0129175
 UNCLASSIFIED

2/2 032

UNCLASSIFIED

PROCESSING DATE-- 27NOV70

CIRC ACCESSION NO--AP0129175

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. SURFACE MAGNETO ACOUSTIC EFFECTS (EFFECT OF A MAGNETIC FIELD ON THE ANGLE OF POLARIZATION OF ULTRASONIC WAVES PASSING THROUGH THE LATTICE) LIKELY TO BE ENCOUNTERED IN MAGNETICALLY POLARIZED METALS AND FERRDIELECTRICS ARE DISCUSSED THEORETICALLY. FOR MAGNETICALLY POLARIZED METALS THESE EFFECTS SHOULD HAVE A NON RESONANT CHARACTER AND THEIR MAGNITUDE MAY BE OF THE SAME ORDER AS THE CONSTANT OF INTERACTION BETWEEN ELASTIC AND SPIRAL ELECTROMAGNETIC WAVES IN THE MATERIAL. SPECIAL EFFECTS ARE TO BE EXPECTED IN THE CASE OF RARE EARTH ALLOYS WITH HIGH MAGNETO STRICTION CONSTANTS.

UNCLASSIFIED

USSR

UDC 518.5.681.3.06

KOBCHIKOV, A. V., KULEYEV, Ya. F., OZHIGANOV, L. I.

"Two Realizations of the Tabular-analytic Method of Calculation of Functions"

Tr. Kazansk. Aviats. In-ta [Works of Kazan' Aviation Institute], No. 104, 1970, pp 59-63 (Translated from Referativnyy Zhurnal Kibernetika, No. 4, April, 1971, Abstract No. 4 V674 by V. Zhdanov).

Translation: The use of a tabular-analytic method for calculation of a binary logarithm and trigonometric functions is studied, based on the representation of the function $y=f(x)$ as $y=\phi(x)+\delta(x)$, where $p(x)$ is an approximating function, rather easy to calculate or produce with a circuit, while $\delta(x)$ is a correcting function stored in a memory unit. For the function $y=\log_2 x$, $0 < x < 1$, we can select $\phi(x)$ as

$$\phi(m^*) = p - 1 + m^*; \quad x = m^{2^p}$$

where $m^*=2^m-1$, while $\delta(m^*)=\log_2(1+m^*)-m^*$. A block diagram of the arithmetic unit producing this algorithm is presented, its operation studied and an estimate given of the accuracy and speed produced in multiplication and division. For the trigonometric functions

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UDC 518.5.681.3.06

USSR

KOBCHIKOV, A. V., KULEYEV, Ya. F., OZHIGANOV, L. I., Tr. Kazansk. Aviats. In-ta, No. 104, 1970, pp 59-63.

$$y = \sin \frac{\pi}{2} x, \quad x = \frac{2}{\pi} \arcsin y; \quad 0 < x < 1.$$

the approximating function can be selected as $\phi(x)=x$ with correction function $\delta(x) = \sin \frac{\pi}{2} x - x$, the maximum value of which is $\delta_{\max} = 0.215$, allowing the volume of tables to be reduced in comparison with the volume of tables of complete values of functions by about 4.6 times.

2/2

I/2 009 UNCLASSIFIED PROCESSING DATE--16OCT70
TITLE--EFFECT OF THE TRANSITION LAYER AT THE RUBBER RUBBER INTERFACE ON
THE COHESIVE ENERGY DENSITY AND ADHESION BETWEEN LAYERS OF VULCANIZATES
AUTHOR--(04)-UREKHOV, S.V., ZAKHAROV, N.D., KULEZNEV, V.N., DEBADKIN, S.A.
COUNTRY OF INFO--USSR
SOURCE--KOLLOIDNYY ZHURNAL, 1970, VOL 32, NR 2, PP 245-250
DATE PUBLISHED-----70
SUBJECT AREAS--MATERIALS
TOPIC TAGS--VULCANIZATE, ADHESION, ELASTOMER COHESION
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1993/0397 STEP NO--UR/0069/70/032/002/0245/0250
CIRC ACCESSION NO--AP0113315
UNCLASSIFIED

2/2 009

UNCLASSIFIED

PROCESSING DATE--16OCT70

CIRC ACCESSION NO--AP0113315

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ADHESION BETWEEN RUBBERS HAS BEEN STUDIED FOR A NUMBER OF RUBBERS. ADHESION BETWEEN PLIED UP RUBBERS DEPENDS ON THE RATIO OF THEIR MOLAR COHESIVE ENERGIES AND CAN SERVE AS A QUALITATIVE CHARACTERISTIC OF THE THICKNESS OF THE TRANSITION LAYER FORMED DURING BLENDING OR PLYING UP OF RUBBERS. THE ADHESION BETWEEN VULCANIZATE LAYERS OF PLIED UP RUBBERS HAS BEEN DETERMINED BY STATIC AND DYNAMIC METHODS. THE DYNAMIC TEST RESULTS ARE IN QUALITATIVE AGREEMENT WITH THE DATA ON ADHESION OF UNCURED POLYMERS AND CAN BE USED TO ASSESS THE EFFECT OF THE TRANSITION LAYER ON CU VULCANIZATION OF RUBBERS. THE RELATIONSHIP BETWEEN THE COHESIVE ENERGY DENSITY AND THE COMPONENTS RATIO, DETERMINED FOR A NUMBER OF BLENDS, DEPENDS ON THE TRANSITION LAYER THICKNESS AND ON THE DIFFERENCE IN COHESIVE ENERGIES OF THE BLENDED RUBBERS.

UNCLASSIFIED

1/2 021 UNCLASSIFIED PROCESSING DATE--300CT70
 TITLE--EFFECT OF MICROGEL ON THE MECHANICAL PROPERTIES OF CIS,POLYISOPRENE
 AND BUTADIENE,STYRENE RUBBERS -U-
 AUTHOR-(04)-KULEZNEV, V.N., ELKINA, I.A., VANKOVA, L.N., DUGADKIN, B.A.
 COUNTRY OF INFO--USSR
 SOURCE--KOLLOIDNYY ZHURNAL, 1970, VOL 32, NR 3, PP 381-387
 DATE PUBLISHED-----70
 SUBJECT AREAS--MATERIALS
 TOPIC TAGS--GEL, POLYMER RHEOLOGY, POLYISOPRENE, BUTADIENE STYRENE RESIN,
 VULCANIZATE, MECHANICAL STRENGTH, RUBBER
 CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FAME--2000/1591 STEP NO--UR/0069/70/032/003/0381/0387
 CIRC ACCESSION NO--APO125213

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--30DCT70

2/2 021

CIRC ACCESSION NO--AP0125213
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE EFFECT OF MICROGEL ON THE
CIS, POLYISOPRENE AND BUTADIENE, STYRENE
RHEOLOGICAL PROPERTIES OF RUBBERS HAS BEEN STUDIED. MICROGEL ENHANCES THE EFFECTIVE VISCOSITY OF
MIXES, REDUCES THEIR SHRINKAGE ON DISCHARGE FROM THE VISCOMETER
CAPILLARY, INCREASES THE CRITICAL STRESS OF ELASTIC TURBULENCE AND HAS
LITTLE EFFECT ON THE STRENGTH PROPERTIES OF VULCANIZATES, PROVIDED THE
VULCANIZING SYSTEM IS PROPERLY CHOSEN.
FACILITY: INSTITUT
TONKOY KHIMICHESKOY TEKHNologii IM. M. V. LOMONOSOVA MOSCOW.

UNCLASSIFIED

1/2 024 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--MUTUAL EFFECT OF HYDROGEN IONS AND SODIUM AND CESIUM CATIONS DURING
THEIR ADSORPTION ON PLATINIZED PLATINUM -U-
AUTHOR--(03)-BALASHOVA, N.A., KAZARINOV, V.YE., KULEZNEVA, N.I.

COUNTRY OF INFO--USSR

SOURCE--ELEKTROKIMIYA 1970, 6(3), 398-9

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--HYDROGEN, SODIUM, CESIUM, ADSORPTION, PLATINUM, ISOTOPE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1998/1136

STEP NO--UR/0864/70/006/003/0398/0399

CIRC ACCESSION NO--AP0121695

UNCLASSIFIED

2/2 024

UNCLASSIFIED

PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0121695

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF H POSITIVE ION CONC. ON THE ADSORPTION OF CS PRIME POSITIVE AND NA PRIME POSITIVE ON PLATINIZED PT WITH A REVERSIBLE H POTENTIAL OF INVESTIGATED. TESTS WERE CONDUCTED IN DIL. SOLNS. OF NA SUB2 SO SUB4 AND CS SUB2 SO SUB4. THE ADSORPTION WAS MEASURED AT PH 0-4, THE AMT. OF ADSORBED CATIONS BEING DETD. BY A RADIOACTIVE TRACER METHOD USING PRIME22 NA AND PRIME134 CS. A MARKED DEPENDENCE OF THE ADSORPTION ON THE H PRIME POSITIVE ION CONC. WAS NOTED. AN ALMOST COMPLETE DISPLACEMENT OF H PRIME POSITIVE IONS FROM THE ELECTRODE SURFACE BY NA PRIME POSITIVE AND CS PRIME POSITIVE IONS OCCURRED WITH A 5-6 FOLD EXCESS OF THE LATTER IN SOLN. FROM THE DIFFERENCES IN THE ADSORPTION OF CS PRIME POSITIVE AND NA PRIME POSITIVE AT EQUAL CONC. RATIOS C SUBCSP POSITIVE-C SUBH POSITIVE AND C SUBNA POSITIVE-C SUBH POSITIVE, IT WAS POSSIBLE TO CALC. THE MAGNITUDE OF THE SPECIFIC ADSORPTION OF CS PRIME POSITIVE IN RELATION TO NA PRIME POSITIVE. THE AMT. OF CS PRIME POSITIVE ADSORBED IS 1.5 PRIME POSITIVE -0.2 TIMES MORE THAN THAT OF NA PRIME POSITIVE. FACILITY: INST. ELEKTROKHM., MOSCOW, USSR.

UNCLASSIFIED

Powder Metallurgy

USSR

UDC 669.24

YELYUTIN, V. P., MOZSHUKHIN, YE. I., REZNIKOV, YU. A., and KUL'GA, G. YA.,
Moscow Institute of Steel and Alloys

"Properties of Nickel Powder Containing Inclusions of Calcium Oxide"

Moscow, Izvestiya Vysshikh Uchebnykh Zavedeniy, Chernaya Metallurgiya,
№ 11, 1971, pp 132-135

Abstract: A study was made of the effect of the recovery temperature of mixtures of NiO and CaO powders and the content of CaO additive in the mixture on the dimension of coherent dispersion domains and micro-distortion of Ni in powders, reduced in a hydrogen current. With rising recovery temperature, micro-distortions of the crystalline lattice of Ni decrease, but the dimension of coherent dispersion domains changes nonmonotonously. The rising recovery temperature goes with an increase of the mean size of Ni-powder particles. The effect of the recovery temperature and inclusions of calcium oxide on the compressibility of bricks by pressing and caking was investigated. The compression degree of bricks by caking decreases with increasing dimension of coherent dispersion domains of Ni. Four illustrations, four bibliographic references.

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USSR

K
KAZHBEROV, V., KUL'GACHEV, A., LEVCHENKO, YU., Engineers

"Underwater Communication Set"

Moscow, Radio, No 10, 1970, pp 42-45

Abstract: An article for electronic enthusiasts describing an ultrasonic transceiver for communication between skin divers and shore personnel, operating at a frequency of 72 KHz. The output power of the transmitter section without modulation is about 1.5 watts. Sound is transformed into electricity by laryngophones of the LF-5 type, and the percentage modulation is 80 percent with nonlinear distortion of 10 percent or less. The unit is fully transistorized, with a transmit-receive switch, and the radiating device is piezoelectric with an efficiency of about 30 percent. A complete schematic of the circuit with component values is given, together with a textual description of its makeup and operation. Photographs of the device, packed into a tube 70 mm in diameter, 450 mm in length, with a wall thickness of 2 mm, are shown.

1/1

USSR

UDC: 539,622

GOLEGO, N. N. and KUL'GAVYY, E. A.

"Installation for Investigation of Friction and Wear of Materials in Low-Temperature Liquids"

Sb. nauch. tr. Kiev. in-t inzh. grazhd. aviatsii (Symposium of Scientific Works of Kiev Institute of Civil Aviation Engineers) 1971, vyp 2, pp 73-75 (from Referativnyy Zhurnal-Aviatsionnyye i Raketnyye Dvigateli, No 7, 1972, Abstract No 7.34.165)

Translation: The installation proposed for investigation of processes of friction and wear of materials in cryogenic liquids, including liquid hydrogen (20°K), is described. The proposed installation may be also used for testing materials in various liquid mediums in the temperature range from 650 to 20°K (1 illustration, resume).

1/1

- 102 -

USSR

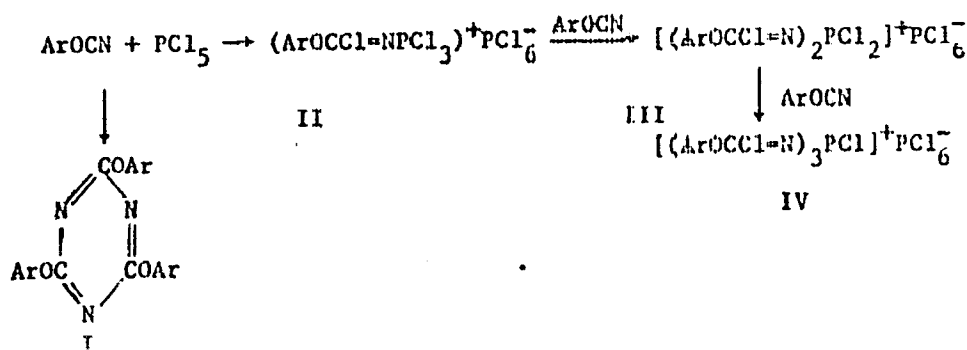
UDC 546.135

SHEVCHENKO, V. I., ~~KHILIBABA, N. K.~~, KIRSANOV, A. V.

"Phosphorylation of Aromatic Cyanates"

Leningrad, Zhurnal Obshchey Khimii, Vol XLII (CIV), No 1, 1972, pp 102-105

Abstract: The interaction of cyanates with phosphorus pentachlorides does not stop in the stage of formation of hexachlorophosphorates (III) but proceeds farther with the formation of hexachlorophosphorates of tris-N-(aroy-chloromethylenimino)monochlorophosphoniums (IV) which are also the final products of the reaction:

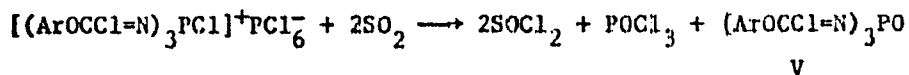


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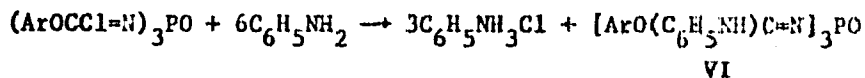
USSR

SHEVCHENKO, V. I., et al., Zhurnal Obshchey Khimii, Vol XLII (CIV), No 1, 1972, pp 102-105

The aromatic cyanates react with phosphorus pentachloride with a mole ratio of 1.5:1 or with excess cyanate with the formation of (IV). The latter react easily with sulfur dioxide with the formation of tris-N-N(aroychloromethylene)triamides of phosphoric acid (V):



On interaction of (V) with analine, tris-N-(aroyphenylaminomethylene) triamides of phosphoric acid (VI) are formed:



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- 35 -

USSR

UDC 546.185

KULIBABA, N. K., SHEVCHENKO, V. I., and KIRSANOV, A. V., Institute of Organic Chemistry, Academy of Sciences Ukrainian SSR

"Reaction of Butyl Cyanates With Phosphorus Pentachloride"

Leningrad, Zhurnal Obshchey Khimii, Sep 71, Vol 41, No 9, pp 2105-2106

Abstract: Use was made of the relatively stable butyl- and isobutyl cyanates to study the reaction of aliphatic cyanates with phosphorus pentachloride. Unlike aromatic cyanates, butyl cyanates react with phosphorus pentachloride not only at the nitrile group but also at the Alk-O bond to form tetrachlorophosphorus isocyanate (I) and butoxychloromethyleneiminotrichlorophosphonium hexachlorophosphates (II). I is a viscous liquid which decomposes on distillation under vacuum. It may be converted to isocyanatophosphoric diacid chloride (III) which is assumed to be the pure form of I. The hexachlorophosphate (II, $R=C_4H_9$) is a crystalline light yellow substance, readily soluble in methylene chloride, dichloroethane, and is insoluble in ether, CCl_4 and hexane. Hexachlorophosphate with an isobutyl radical is a viscous liquid which decomposes on distillation under vacuum. It can be converted to N-(butoxychloromethyl)amidophosphoric diacid chlorides -- a colorless liquid which can be distilled in vacuum undecomposed.

1/1

- 60 -

USSR

YEGIYAN, K. SH., BOCHEK, G. L., KULIBABA, V. I., and GRISHAYEV, I. A., Yerevan Physics Institute and Engineering Physics Institute of Academy of Sciences Ukrainian SSR

"Angular and Energy Distribution of Proton in (γ p) and (ep) Reactions at C^{12} Nuclei for Excitation Energies up to 130 MeV"

Yerevan, Izvestiya Akademii Nauk Armyanskoy SSR, Fizika, Vol 6, No 3, 1971, pp 161-167

Abstract: Measurements of cross sections (γ p) and (ep) of reactions at C^{12} nuclei for excitation energies up to 130 MeV are reported. The study was performed on the 300-MeV linear electron accelerator of the Engineering Physics Institute of the Academy of Sciences Ukrainian SSR. A beam of electrons in the linear accelerator, turned once, was focused on a 0.083 radial units-thick target located in the scattering chamber connected by vacuum with the accelerator. The angle between beam direction and normal to the target surface was 45° . The electron beam intensity was measured by a secondary emission monitor at two gold foils with total thickness of 20 microns. Secondary protons were identified by the "impulse-flight" method. The total yield of protons was measured in the following reactions: $\gamma + C^{12} \rightarrow$
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USSR

YEGHYAN, K. SH., et al., Izvestiya Akademii Nauk Arzyanskoy SSR, Fizika, Vol 6, No 3, 1971, pp 161-167

$p + B$, and $e + C^{12} \rightarrow e' + p + B$. Results were compared with the quasi-deuteron and one-particle models of photon absorption in nuclei. The best agreement of theoretical and experimental energy spectra was achieved at $B = 60$ MeV (V is the value of the potential at the bottom of the potential well). In the comparison made with the one-particle model of photon absorption, agreement between experimental and calculated values for both energy and angular spectra could not be obtained. However, the findings showed that in the region of excitation energy below the meson production threshold, data on the reactions (γp) and (γp) at complex nuclei do not contradict either the quasideuteron or the one-particle model of photon absorption.

2/2

- 120 -

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USSR

UDC 539.1

YEGIYAN, K. SH., BOCHEK, G. L., GRISHAYEV, I. A., ALLENKANYAN, K. V., KULIBABA, V. I., and SIPENKO, M. L., Yerevan Physics Institute, Physicotechnical Institute of the Academy of Sciences Ukrainian SSR

"Apparatus for the Study of Direct Nuclear Reactions Caused by Electrons and Gamma Quanta With an Energy of Up to 300 Mev"

Yerevan, Izvestiya Akademii Nauk Armyanskoy SSR, Vol 5, No 5, 1970, pp 381-391

Abstract: The article gives a description of an apparatus designed for studying nuclear structure and the character of the interactions of electrons and gamma quanta with a maximum energy of up to 300 Mev. A focused beam of the 300-Mev Khar'kov linear accelerator goes from a parallel transfer system over a vacuum electronic conductor into a scattering chamber. Revolving around the latter on a fixed platform are two magnetic analyzers designed to record secondary reaction particles produced by the gamma quanta or electrons. Situated on an extension of the electronic

1/3

USSR

YEGIYAN, K. SH., et al., Izvestiya Akademii Nauk Armyanskoy SSR, Vol 5, No 5, 1970, pp 381-391

conductor after the scattering chamber is a secondary emission monitor for the relative measurement of the electron beam intensity. After the secondary emission monitor the electron beam is absorbed by a burial ground of heavy concrete blocks. The apparatus was tested by measuring the elastic-scattering cross-section for electrons on a free proton in a CH_2 target. A feature of the apparatus is that it works under a high background level from the electron beam. The calibration measurements performed indicate that the apparatus permits the study of direct nuclear reactions with a cross-section of $\geq 2 \cdot 10^{-3}$ sq cm/steradian.

The authors thank A. I. ALIKHANYAN, Corresponding Member of the Academy of Sciences USSR, and Professor V. M. ARARITONOV, Sector Chief of Yerevan Physics Institute, for their interest in the work and repeated discussions; N. I. MOCHESHNIKOV, Sector Chief of the Physicotechnical Institute, for his assistance in

2/3

- 83 -

USSR

YEGIYAN, K. SH., et al., Izvestiya Akademii Nauk Armyanskoy SSR, Vol 5, No 5, 1970, pp 381-391

organizing and carrying out the work, E. V. TER-MINASYAN, Chief of the Design Bureau of Yerevan Physics Institute, and Senior Engineer G. G. MAMIKONYAN for designing the apparatus;

L. A. MAKHNENKO, Sector Chief of the Physico-technical Institute, Academy of Sciences Ukrainian SSR, G. A. DEMYANENKO, Chief of the LU-300 Installation, and the entire LU-300 installation staff for their daily assistance in carrying out the experiment; and G. O. OVSEPYAN, D. A. ZARGARYAN, and L. A. SARKISYAN, staff members of Yerevan Physics Institute, for their part in the work of preparing and testing the apparatus and their part in the physical measurements.

3/3

USSR

UDC 632.95

KULIBABA, Yu. F., and IGNATOVA, Ye. A., Scientific Research Institute of Horticulture and Floriculture, and Sochin Toxicological Laboratory, All Union Institute of Plant Protection

"Pesticides for the Protection of Flori-Decorative Cultures"

Moscow, Khimiya v Sel'skoi Khozyzstve, Vol 11, No 8 (118), 1973, pp 40-42

Abstract: The preparations: benzophosphate, amiphos, DDVF, sayphos, and phosphamide are effective against haustellate pests of the floridecorative cultures. Against the rose powdery mildew best results were obtained with caratan, euparene, MS-1053, and colloidal sulfur. The effective agents against carnation rust were tsineb, captain, phigon, phtalan, and maneb used prophylactically; phigon and polycarbacin were effective against heterosporiosis. All of these preparations caused no leaf burn and did not depress the growth or the development of plants.

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- 36 -

Miscellaneous

USSR

UDC 669.15'26-194:621.787.7

VINOKUR, B. B., GRAUN, M. P., KHIL'CHEVSKAYA, T. V., GELLER, A. L., KULICHENKO, V. P., and SHIYANOVSKIY, V. I., Institute of Casting Problems, Academy of Sciences, Ukrainian SSR

"Carbide Transformations in Complexly Alloyed Steel Containing One Percent Chromium"

Moscow, Izvestiya VUZ, Chernaya Metallurgiya, No 10, 1973, pp 104-108

Abstract: On the basis of studying carbide deposition by chemical and x-ray structural methods the authors concluded that a special chromium carbide Me_7C_3 is formed. The methods used include microdiffraction of carbides extracted into a replica, distortions of the second and third type, modifications in the electrical resistance, coercive forces, microhardness, expanding the steel in the state of quenching and annealing at temperatures of 400-650° C. Under ordinary an-

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USSR

VINOKUR, B. B., et al., Izvestiya VUZ, Chernaya Metallurgiya, No 10, 1973, pp 104-108

nealing conditions this carbide is formed by a gradual restructuring of the iron carbide in proportion to how much it is doped with chromium, manganese, and tungsten. A coherent bond is retained between the lattices. Lengthy annealing at 650° C will result in a separation of trigonal chromium carbide.

Table 1 compares the chemical composition of the carbide phase as a function of annealing temperature; Table 2 identifies the carbide phases after different annealing conditions. Figure 1 shows the influence of annealing temperature on change in the fine crystal structure and certain physical characteristics of a steel. Figure 2 is an electron diffraction pattern of the carbides and an identification of the carbide phases following annealing at 650° C for a period of four hours.

The article contains 2 illustrations, 2 tables, and 9 bibliographic references.

7/7

1/2 032 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--TRANSITIONS IN POLYBUTADIENES -U-
AUTHOR--(04)-KULICHIKHIN, V.G., DZYURA, YE.A., MALKIN, A.YA., VINOGRADOV,
G.V.
CCOUNTRY OF INFO--USSR
SOURCE--VYSOKOMOL. SOEDIN., SER. A 1970, 12(3), 568-73
DATE PUBLISHED-----70

SUBJECT AREAS--MATERIALS, CHEMISTRY

TOPIC TAGS--POLYBUTADIENE, TRANSITION TEMPERATURE, MELTING POINT,
CATALYTIC POLYMERIZATION, COMPLEX COMPOUND, THERMOMECHANICAL PROPERTY,
DIELECTRIC PROPERTY, ISOMER, SYNTHETIC RUBBER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1995/1209

STEP NO--UR/0459770/012/003/0568/0573

CIRC ACCESSION NO--AP0116674

UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--100CT70

2/2 032

CIRC ACCESSION NO--AP0116674

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE GLASS TRANSITION TEMP. (T
 SUBG) AND M.P. OF STEREOREGULAR 1,4,POLYBUTADIENE RUBBERS (I) (PREPD. BY
 POLMN. IN THE PRESENCE OF COMPLEX CATALYSTS CONTG. TI SALTS AND HAVING
 VARIABLE AMTS. OF 1,4,CIS AND 1,4,TRANS ISOMERS) WERE STUDIED BY
 THERMOMECH., DIELEC., AND MECH. METHODS. THE M.P. OF I DECLINED WHEN
 EITHER CIS OR TRANS HOMOPOLYMER WAS INTRODUCED INTO THE POLYMER CHAIN.
 I FAILED TO CRYSTALLIZE WHEN 30-70PERCENT OF EITHER ISOMER WAS PRESENT.
 THE T SUBG STEADILY INCREASED WITH INCREASED CONTENT OF 1,4,TRANS UNITS.
 EXTRAPOLATION OF THE CURVE PLOTTED FOR T SUBG VS. CONTENT OF 1,4,TRANS
 UNITS GAVE THE T SUBG OF THE CIS AND TRANS ISOMERS AS NEGATIVE 100 AND
 NEGATIVE 75DEGREES, RESP. FACILITY: INST. NEFTEKHIM. SIN. IM.
 TOPCHIEVA, MOSCOW, USSR.

UNCLASSIFIED

Acc. Nr: **AP0052539** - Abstracting Service:
CHEMICAL ABST. 5-70

Ref. Code:

418 0459

K

101597s Changes in the viscoelastic properties of 1,4-polybutadienes during vulcanization. Kulichikhin, Ya. G.; Malkin, A. Ya.; Vinogradov, G. V. (Inst. Neftekhim. Sin. im. Topchieva, Moscow, USSR). *Vysokomol. Soedin., Ser. A* 1970, 12(1), 129-34 (Russ). Samples of 1,4-polybutadiene rubber (I) were vulcanized at 80° using S-ZnO-(Me₂NCS)₂S₂ vulcanizing system. The changes of I viscosity, visco-elastic deformation, elasticity modulus, normal stress, tangential stress (required to produce a given deformation), and the amt. of sol. fraction in I with the vulcanization time had an induction period (θ). The viscosity θ decreased linearly with I mol. wt. increase. After θ was reached, the viscosity increased uniformly until the 3-dimensional I structure was established. The elasticity modulus had its max. at the gel point. CPJR

gl.

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19821182

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Acc. Nr:

AP0052540

Abstracting Service:

CHEMICAL ABST. 5-7c

Ref. Code:

UR 1459

K

101188j High elasticity of 1,4-polybutadienes of different microtacticity. Malkin, A. Ya.; Kulchikov, V. G.; Zakhmina, M. P.; Vinogradov, G. V. (Inst. Neftekhim. Sin. im. Topchieva, Moscow, USSR). *Vysokomol. Soedin., Ser. A* 1970, 12(1), 120-8 (Russ). The viscosity changes, viscoelastic deformation (γ) vs. shear rate ($d\gamma/dt$), γ vs. mol. wt., γ vs. shear stress, elasticity modulus vs. shear stress, the effect of 1,4-cis units content on the elasticity modulus, and related rheol. properties of 1,4-polybutadienes (I) were studied at 50°, 10^{-1} - 10^2 sec $^{-1}$ $d\gamma/dt$, and 5×10^{-2} - 10^{-3} P viscosity ranges. Low mol. wt. I did not obey Hooke's shear law. There was a sharp difference in rheol. properties of I below and above a crit. mol. wt. value, the magnitude of which depended on the tacticity and on $d\gamma/dt$. In the low $d\gamma/dt$ region the above relations agreed with A. S. Lodge's theory (1964). Non-Newtonian flow begins after reaching the crit. mol. wt. and the crit. $d\gamma/dt$. CPJR

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REEL/FRAME
19821183

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1/2 016 UNCLASSIFIED PROCESSING DATE--02JCT70
 TITLE--MICROSTRUCTURE AND RHEOLOGICAL PROPERTIES OF POLYBUTADIENES -U-
 AUTHOR-(03)-VINOGRADOV, G.V., MALKIN, A.YA., KULICHIKHIN, V.G.
 COUNTRY OF INFO--USSR
 SOURCE--J. POLYM. SCI., PART A-2 1970, 8(3), 333-53
 DATE PUBLISHED-----70
 SUBJECT AREAS--NAVIGATION, MATERIALS
 TOPIC TAGS--RHEOLOGIC PROPERTY, MOLECULAR STRUCTURE, VISCOSITY,
 POLYBUTADIENE
 CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY RELL/FRAME--1993/0216 STEP NO--US/0000/70/008/003/0333/0353
 CINC ACCESSION NO--AP0113155
 UNCLASSIFIED

K

2/2 016

UNCLASSIFIED

PROCESSING DATE--02OCT70

CIRC ACCESSION NO--AP0113155

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE VISCOSITIES, RUBBERY DEFORMATIONS, DENSITIES, AND THEIR DEPENDENCE ON TEMP. WERE MEASURED FOR SEVERAL SERIES OF POLYBUTADIENES WITH MOL. WTS. RANGING FROM 5000 TO 400,000 AND DIFFERING IN PROPORTIONS OF CIS AND TRANS STRUCTURES (CIS CONTENT FROM 40 TO 95PERCENT). ON THE BASIS OF THE VISCOSITY MEASUREMENTS THE CRITICAL MOL. WT. M_{SUBC} WAS DETD., CORRESPONDING TO A SHARP CHANGE IN THE NATURE OF THE VISCOSITY VS. MOL. WT. DEPENDENCE. RUBBERY DEFORMATIONS ARE DISPLAYED PRONOUNCEDLY IN SPECIMENS WITH M LARGER THAN M_{SUBC} AND ARE CLOSELY RELATED TO THE APPEARANCE OF NON NEWTONIAN FLOW. THE VALUE OF M_{SUBC} DEPENDS ON THE RELATIVE CONTENT OF CIS AND TRANS FORMS. WHEN M LARGER THAN M_{SUBC} , THE INITIAL VISCOSITY IS A PARAMETER SENSITIVE TO THE MICROSTRUCTURE OF POLYBUTADIENES, SO THAT AT A SINGLE MOL. WT., DEPENDING ON THE RATIO OF CIS AND TRANS UNITS, THE VISCOSITY MAY VARY OVER A MORE THAN TENFOLD RANGE. THE GLASS TRANSITION TEMP. AND ACTIVATION ENERGY OF VISCOUS FLOW RISE REGULARLY WITH INCREASING TRANS CONTENT IN THE POLYMER CHAIN, THESE PARAMETERS BECOMING INDEPENDENT OF THE MOL. WT. FOR SPECIMENS WITH M LARGER THAN M_{SUBC} WITHIN A SERIES OF POLYBUTADIENES OF EQUAL MICROTACTICITY. THERMO MECH. INVESTIGATIONS OF POLYBUTADIENES ALSO MADE IT POSSIBLE TO DEFINE MORE ACCURATELY THE BOUNDARIES OF THE CRYSTN. REGION AND THE DEPENDENCE OF THE MELTING POINT ON THE MICROTACTICITY. THE RESULTS OBTAINED ARE DISCUSSED ON THE BASIS OF MODERN IDEAS OF POLYMER STRUCTURES.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--11SEP70
 TITLE--EFFECT OF DIBORANE ON HUMIC ACIDS -U-
 AUTHOR--MAKSIMOV, O.B., KULICHKOVA, V.A., GLEBKO, L.I.
 COUNTRY OF INFO--USSR
 SOURCE--KHIM. TVERD. TOPL. 1970, (1), 14-17
 DATE PUBLISHED-----70
 SUBJECT AREAS--CHEMISTRY
 TOPIC TAGS--DIBORANE, TETRAHYDROFURAN, QUINONE, WOOD PRODUCT
 CONTROL MARKING--NO RESTRICTIONS
 DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAME--1990/2045 STEP NO--UR/0467/70/000/001/0014/0017
 CIRC ACCESSION NO--A20109977
 UNCLASSIFIED

UNCLASSIFIED

PROCESSING DATE--11SEP70

2/2 017

CIRC ACCESSION NO--AP0109977
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE SOLY. OF HUMIC ACIDS (I) IN
TETRAHYDROFURAN STRONGLY DECREASES DURING THE REACTION WITH DIBORANE
(II). THE REMAINING I HAS A CHARACTER OF A NONAROMATIC ALC. THE
REACTION OF II WITH I C=O GROUPS NEEDS GREATER THAN 15 HR, WITH OTHER
C=O GROUPS GREATER THAN 30 DAYS. THE DEGREE OF PARTICIPATION OF QUINONE
GROUPS IN THE REDN. COULD NOT BE DETD.

UNCLASSIFIED

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USSR

UDC 622.71623.343

BOCHAROV, V. A., KULIGIN, S. A., and ARZHANNIKOV, G. I.

"Extraction of Zinc and Gold From Ural Copper-Zinc Ores"

Moscow, Tsvetnyye Metally, No 10, Oct 70, pp 80-82

Abstract: This article deals with problems related to the extraction of Zn and Au from Cu-Zn ores by the method of collective-selective flotation at various Ural ore concentration plants. Zinc extraction varies between 44 and 69%, and its losses are ~25% in pyrite concentrates, and 10% in copper concentrates. Causes of zinc losses are discussed. Measures for improving the qualitative and quantitative concentration indices at various plants are outlined. It is stated that the extraction of Au from Ural ores presents even greater problems, and that despite new procedures increases in output have been insignificant. The causes of low Au output level are examined and the possibilities for increasing the output from compact pyrite ores are considered. The realization of a complex processing of pyrite concentrates (containing 1.5 g/ton Au) is one of the urgent problems.

1/1

172 043 UNCLASSIFIED PROCESSING DATE--3000170
TITLE--MECHANISM OF RADIATION ACTION ON THE CATION EXCHANGER KU-2 -U-

AUTHOR--(03)--KISELEVA, YE.D., CHMUTOV, K.V., KULIGINA, N.V.

COUNTRY OF INFO--USSR

SOURCE--ZH. FIZ. KHIM. 1970, 44(2), 476-81

DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--CATION EXCHANGE RESIN, AIR, WATER, OXYGEN, CHEMICAL REACTION
MECHANISM, RADIATION EFFECT/(U)KU2 CATION EXCHANGE RESIN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/2173

STEP NO--UR/0076/70/044/002/0476/0481

CIRC ACCESSION NO--AP0125753
UNCLASSIFIED

2/2 043

UNCLASSIFIED

PROCESSING DATE--3000170

CIRC ACCESSION NO--AP0125753

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT OF H SUB2 O AND O FROM AIR AND VARIOUS IONS WAS STUDIED ON CHANGES IN THE ION EXCHANGING SULFO GROUPS DURING IRRADN. OF THE CATION EXCHANGER KU-2. THE RESIN WAS IRRADIATED IN THE FOLLOWING FORMS: H PRIME POSITIVE, FE PRIME3 POSITIVE, CE PRIME4 POSITIVE, AND CU PRIME2 POSITIVE. WHEN INCREASING THE DOSE OF THE IRRADN. FROM 0.62 TIMES 10 PRIME9 TO 2.1 TIMES 10 PRIME9 RAD, THE SPLITTING OF ION EXCHANGING GROUPS FROM THE DRY RESIN INCREASES, MASS AND THE SWELLING DECREASE. FOR THE KU-2 IN FE PRIME3 POSITIVE, CU PRIME2 POSITIVE, CE PRIME4 POSITIVE, AND NA PRIME POSITIVE FORMS, THE ION EXCHANGING CAPACITY IS DECREASED MORE THAN IN THE CASE OF THE H PRIME POSITIVE FORM. THE INFLUENCE OF H SUB2 O WAS STUDIED FOR 2 DOSES: 0.62 TIMES 10 PRIME23 AND 0.38 TIMES 10 PRIME33 EV PER G. THE YIELD OF H SUB2 SO SUB4 AND THE LOSS OF THE ION EXCHANGING CAPACITY OF THE MOIST KU-2 INCREASES UP TO A CERTAIN H SUB2 O CONC., AND REMAINS CONST. FOR HIGHER H SUB2 O CONCNS. ONLY THE H SUB2 O MOLECULES IN THE HYDRATION SHELL ADJACENT TO THE SORBENT ARE ABLE TO AFFECT THE CHANGES. A PORTION OF S IS CONVERTED TO A STATE WHERE IT IS NOT ABLE TO BE EXCHANGED.

FACILITY: INST. FIZ. KHIM., MOSCOW, USSR.

Radiation Chemistry

UDC 541.5

USSR

KISELEVA, YE. D., CHERUTOV, K. V., and KULIGINA, N. V., Institute of Physical Chemistry, Academy of Sciences USSR Moscow

"Mechanism of the Action of Radiation on the Cation Exchanger KU-2"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 44, No 2, Feb 70, pp 476-481

Abstract: The effects of irradiation with gamma-rays on the cation-exchange resin KU-2 were studied. KU-2 is a sulfonated styrene-divinylbenzene copolymer. The resin was irradiated in the H^+ , Fe^{3+} , Ce^{4+} , and Cu^{++} forms with doses in the $0.3 \times 10^9 - 2.1 \times 10^9$ rad range. Irradiation of the resin in the dry state with increasing doses resulted in increased splitting-off of ion-exchange groups, while the mass of the resin, its exchange capacity, and its degree of swelling decreased. Radiation-chemical decomposition was greater in the presence of O_2 than in vacuo. Presence of Fe^{3+} , Ce^{4+} , and Cu^{++} as well as that of Na^+ in experiments in which irradiation of Na KU-2 with accelerated electrons was carried out protected the resin' decomposition was reduced as compared with that on irradiation of KU-2 in its H^+ form. It has been established in earlier work that Fe^{3+} and Cu^{++} exert a protective effect on KU-2 even in the
1/2

USSR

KISELEVA, YE. D., et al., Zhurnal Fizicheskoy Khimii, Vol 4.,
No 2, Feb 70, pp 476-481

presence of H₂O because they act as electron acceptors during irradiation. During irradiation in the dry state in experiments carried out in this instance, protective action was exerted by the metal cations by reason of a cage effect which prevented detachment of SO₃ - metal cation groups, while the smaller SO₃H groups of KU-2 in the H⁺ form were detached. With increasing degrees of filling of the resin with Cu⁺⁺, the protective effect of Cu⁺⁺ increased. On irradiation of KU-2 containing H₂O, the formation of H₂SO₄ and loss of exchange capacity by the resin increased up to a certain H₂O content lower than that required for complete swelling and then remained constant at higher H₂O amounts. Evidently only molecules of the hydrate film adjacent to the ion-exchanger surface promoted decomposition under the effect of radiation.

2/2

Radiation Chemistry

USSR

UDC 541.5

K
KISELEVA, YE. D., CIRUTOV, K. V., and KULIGINA, N. V., Institute of Physical Chemistry, Academy of Sciences USSR Moscow

"Mechanism of the Action of Radiation on the Cation Exchanger KU-2"

Moscow, Zhurnal Fizicheskoy Khimii, Vol 44, No 2, Feb 70, pp 476-481

Abstract: The effects of irradiation with gamma-rays on the cation-exchange resin KU-2 were studied. KU-2 is a sulfonated styrene-divinylbenzene copolymer. The resin was irradiated in the H^+ , Fe^{3+} , Ce^{4+} , and Cu^{++} forms with doses in the 0.3×10^9 - 2.1×10^9 rad range. Irradiation of the resin in the dry state with increasing doses resulted in increased splitting-off of ion-exchange groups, while the mass of the resin, its exchange capacity, and its degree of swelling decreased. Radiation-chemical decomposition was greater in the presence of O_2 than in vacuo. Presence of Fe^{3+} , Ce^{4+} , and Cu^{++} as well as that of Na^+ in experiments in which irradiation of Na KU-2 with accelerated electrons was carried out protected the resin' decomposition was reduced as compared with that on irradiation of KU-2 in its H^+ form. It has been established in earlier work that Fe^{3+} and Cu^{++} exert a protective effect on KU-2 even in the 1/2

USSR

KISELEVA, YE. D., et al., Zhurnal Fizicheskoy Khimii, Vol 4,,
No 2, Feb 70, pp 476-481

presence of H_2O because they act as electron acceptors during irradiation. During irradiation in the dry state in experiments carried out in this instance, protective action was exerted by the metal cations by reason of a cage effect which prevented detachment of SO_3 - metal cation groups, while the smaller SO_3H groups of KU-2 in the H^+ form were detached. With increasing degrees of filling of the resin with Cu^{++} , the protective effect of Cu^{++} increased. On irradiation of KU-2 containing H_2O , the formation of H_2SO_4 and loss of exchange capacity by the resin increased up to a certain H_2O content lower than that required for complete swelling and then remained constant at higher H_2O amounts. Evidently only molecules of the hydrate film adjacent to the ion-exchanger surface promoted decomposition under the effect of radiation.

2/2

1/2 030 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--MECHANISM OF THE ACTION OF IONIZING RADIATION ON THE ANION
EXCHANGER AV-17 -U-
AUTHOR--(03)-KISELEVA, YE.D., CHMUTOV, K.V., KULIGINA, N.V.
COUNTRY OF INFO--USSR
SOURCE--ZH. FIZ. KHIM. 1970, 44(2), 472-5
DATE PUBLISHED-----70

SUBJECT AREAS--CHEMISTRY, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--IONIZING RADIATION, GAMMA RADIATION, AMINE, ION EXCHANGE
RESIN, HYDROGEN BONDING, MOLECULAR STRUCTURE, CHEMICAL REACTION
MECHANISM, WATER, METHYLENE/(U)AV17 ION EXCHANGE RESIN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1995/1398

STEP NO--UR/0076/70/0-4/002/0472/0-75

CIRC ACCESSION NO--AP0116845

UNCLASSIFIED

2/2 030

UNCLASSIFIED

PROCESSING DATE--3000170

CIRC ACCESSION NO--AP0116845

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE EFFECT WAS STUDIED OF GAMMA RADIATION ON SAMPLES OF AV-17 ANION EXCHANGER IN THE NO SUB3 PRIME NEGATIVE FORM. THE SAMPLES WERE IRRADIATED AT REDUCED PRESSURE (10 PRIME NEGATIVE5-10 PRIME NEGATIVE4 TORR), IN THE PRESENCE OF AIR O, EITHER DRY OR IN THE PRESENCE OF DIFFERENT AMTS. OF H SUB2 O. WHEN IRRADIATING DRY SAMPLES WITH A DOSE OF SIMILAR TO 10 PRIME9 RAD, SECONDARY AND TERTIARY AMINES ARE FORMED. THIS INDICATES THAT THE ION EXCHANGE GROUPS ARE AFFECTED. IN THE PRESENCE OF H SUB2 O, THE TRIMETHYLAMINE (I) YIELD DEPENDS ON THE H SUB2 O CONCN. THE INCREASE IN THE YIELD OF I IN THE PRESENCE OF SMALL AMTS. OF H SUB2 O MAY BE EXPLAINED ON THE BASIS THAT THESE SMALL AMTS. OF H SUB2 O STILL DO NOT FACILITATE THE PASSAGE OF ELECTRONS VIA THE METHYLENE BRIDGE. DUE TO H BOND FORMATION, H SUB2 O LEADS TO A DECREASE IN THE ENERGY OF THE C-N BOND SO THAT THE PROBABILITY OF ITS SPLITTING IS INCREASED. THE H SUB2 O SWELLED ANION EXCHANGER MAY BE CONSIDERED AS A NEW MOL. STRUCTURE WITH A DIFFERENT DISTRIBUTION OF ENERGY. ELECTRONS ARE SHIFTED TO POLAR ANION EXCHANGING GROUPS BY MEANS OF H BONDS OF THE HYDRATION SHELL OF H SUB2 O.

FACILITY: INST. FIZ. KHIM., MOSCOW, USSR.

UNCLASSIFIED

Controls

USSR-

VALITOV, R. A., NAYDEROV, V. Z., BARZHIN, V. YA., KULIK, A. A.

Generatory Stimuliruyushchikh Signalov dlya Avtomaticheskikh Sistem Kontrolva (Stimulating Signal Generators for Automated Monitoring and Control Systems), Moscow, ENERGIYA, Biblioteka po Avtomatike, No 401, 1972, 65 pp

Translation: A classification of stimulating signal generators and the requirements imposed on them are presented in this booklet. The principles of constructing stimulating signal generators for controlling the characteristics of radiotechnical channels are discussed.

The booklet is designed for engineers working in the field of automation of control of the operation of radioelectronic devices.

CONTENTS

Introduction 4

Chapter 1. General Information on Stimulating Signal Generators 5

 1. Parameters and Characteristics of Radiotechnical Devices
 Controlled by Stimulating Signal Generators 5

 2. Classification of Stimulating Signal Generators 6

 3. Characteristics of Stimulating Signal Generators and Basic
 Requirements on Them 9

1/2

USSR

VALITOV, R. A., et al., Generatory Stimuliruyushchikh Signalov dlya Avtomaticheskikh Sistem Kontrolya, Moscow, ENERGIYA, Biblioteka po Avtomatike, No 461, 1972, 65 pp

Chapter 2. Schematic and Structural Principles of Stimulating Signal Generators 10

4. Generators for Monitoring the Parameters of Direct Current Amplifiers and Low-Frequency Aperiodic Amplifiers 10

5. Frequency Synthesizers 31

6. Stimulating Signal Generators with Quartz Crystal Frequency Stabilization 47

7. Generators for Controlling the Frequency Characteristics of Radio Frequency and Low-Frequency Channels 56

Bibliography 65

USSR

KULIK, A. P., BARANOV, N. V., KHLOPOV, V. P., OBODZINSKIY, V. G.

"Automatic Device for Fatigue Testing of Aircraft Structures"

Otkrytiya Izobreneniya Promyshlennyye Obrazttsy Tovarnyye Znaki, No 5, 1972,
Patent No 359564.

Translation: 1. An automatic device for fatigue testing of aircraft structures, containing a programming device, controlling the operation of the control device, actuating mechanisms loading the structure being tested, feedback sensors tracking the signal processing system, an emergency protection device, differing in that in order to increase the sensitivity and operational reliability, the control device consists of contact couples connected by a contact in the tracking system into circuits of switches which switch the actuating mechanism to loading or unloading.

2. A device according to Claim 1, differing in that in order to prevent nonfatigue rupture of the structure, the feedback sensors are installed at the test points and connected with the tracking system through the contacts of a switch.

3. A device according to Claim 1, differing in that in order to increase the upper limit of loading frequency of the structure, the hydraulic

1/2

USSR

KULIK, A. P., BARANOV, N. V., KHLOPOV, V. P., OBODZINSKIY, V. G., Otkrytiya Izobreneniya Promyshlennye Obraztsy Tovarnyye Znaki, No 5, 1972, Patent No 359564.

system includes a hydraulic accumulator and electrically controlled hydraulic distributors, connecting the accumulator to the actuating cavity of the force exciter during the load cycle, switching the accumulators from the operating cavity of the force exciter to the pressure line during the unload cycle.

4. A device according to Claim 1, differing in that in order to increase the reliability of operation of the emergency protection system by checking its readiness, it includes emergency imitators consisting of buttons connected to the circuit controlling the switches of the emergency protection system.

2/2

USSR

UDC: 621.396.6:621.315.612

KULIK, B. A.

"On the Nature of Dielectric Losses in Ceramic Materials at Audio and Radio Frequencies"

Elektron. tekhnika. Nauchno-tekhn. sb. Radiodetali (Electronic Technology. Scientific and Technical Collection. Radio Components), 1970, vyp. 2 (19), pp 59-66 (from RZh-Radiotekhnika, No 1, Jan 71, Abstract No 1M374)

Translation: The author gives the basic parameters of relaxation polarization of a number of rf ceramic materials. Consideration is given to the possibility of determining the nature of this type of polarization.

1/1

USSR

UDC 627.8:626-33:532.543

KULIK, G. F.

"Calculating the Tailrace in Channels with Trapezoidal Cross Section"

Izv. vyssh. uchebn. zavedeniy. Str-vo i arkhitektura (News of the Higher Institutions of Learning. Construction and Architecture), No 10, 1970, pp 100-105 (from RZh-Elektrotehnika i Energetika, No 2, Feb 71, Abstract No 2 D66)

Translation: The results of studying the joining of the water races in a trapezoidal channel for a broad range of variation of the flow and channel characteristics are discussed. It is established that the movement of the liquid in the water race section can be nonsteady state. The research procedure is based on hydromechanical theory of nonsteady state motion. The basic forms of water races in trapezoidal channels are established as a result of the research: 1) free spreading of the water on the surface; 2) fragmentary flow: a) turbulent, b) quiescent. The optimal form of joining of the water races for which extinguishing of the excess kinetic energy and damping of the maximum average bottom velocities takes place most intensely and the flow goes from the turbulent state to the quiescent state in a minimum distance (analogously to a complete jump under two-dimensional conditions in the critical state) is discovered on the basis of studying the velocity structure of the flow. For the optimal form of joining of the water races with channel slopes of $m = 1.0, 1.5, 2.0$ and 3.0 , the calculation relations are established for determining

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USSR

KULIK, G. F., Izv. vyssh. uchebn. zavedeniy. Str-vo i arkhitekt., No 10, 1970,
pp 100-105

the associated depths and length of the section of the transition of the flow from the turbulent state to the quiescent state application of which will permit better design of structures and a decrease in material and labor expenditures on repair operations. There are 3 illustrations and a 12-entry bibliography.

2/2

USSR

UDC 538.565

BYCHKOVA, N. N., KULIK, I. O., Physico-technical Low Temperature Institute of the Ukrainian SSR Academy of Sciences, Khar'kov

"Nonlinear Effects in Superconducting Resonators"

Leningrad, Zhurnal Tekhnicheskoy Fiziki, Vol XLII, No 3, 1972, pp 584-590

Abstract: A study was made of the problem of the generation of harmonics in a superconducting resonator with a high amplitude of the high-frequency field and in the presence of a parallel surface of a constant magnetic field. In spite of the smallness of the transformation coefficient for single reflection of the wave from the superconductor ($R_m = 10^{-8}-10^{-10}$), the total power transformation coefficient to the harmonic power is defined by the product QR_n (Q is the Q-factor), and under optimal conditions it can reach a value of $\sim 1\%$. The incidence of the plane electromagnetic wave on a superconducting half-space is investigated, and the intensity and spectral composition of the reflected wave are calculated. A similar statement of the problem was investigated previously [N. A. Fedorov, Pis'ma ZhETF, No 9, 639, 1969; ZhETF, No 59, 1716, 1970]. However, in those papers the calculation was performed by amplitude expansion of the field. In the present article, the case of arbitrary

1/2

USSR

BYCHKOVA, N. N., et al., Zhurnal Tekhnicheskoy Fiziki, Vol XLII, No 3, 1972, pp 584-590

intensity is investigated, and the expansion parameter is the dimensionless impedance [L. D. Landau, et al., Elektrodinamika sploshnykh sred, Gostekhnizdat Press, 1957)] $\zeta = (\omega/c)|\delta|$ which is small by comparison with one (δ is the complex "depth of penetration"). Within the framework of the investigated model under optimal conditions ($h_1 \sim 1$), the product QR_m can be on the order of 10^{-2} .

2/2

- 115 -

USSR

UDC:669-405:[537+535

KULIK, I. O., YANSON, I. K.

"The Josephson Effect in Superconducting Tunnel Structures"

Effekt Dzhozefsona v Sverkhprovodyashchikh Tunnel'nykh Strukturakh
[English Version Above], Moscow, Nauka Press, 1970, 272 pages (Trans-
lated from Referativnyy Zhurnal Fizika, No. 11, 1970, Abstract No. 11 Ye
1185K, Unsigned)

Abstract: Contents of the monograph: Chapter I. Theory of the Joseph-
son Effect. Chapter II. Experimental Study of Stable Josephson Current.
Chapter III. Experimental Study of Unstable Josephson Effect. Extensive
Bibliography.

1/1

KULIK, L.M.

Technical
Science
(Design)

TECHNOLOGICAL DESIGN CLASSIFICATION OF PARTS

Lecture by L.M. Kulik, L.S. Kuznetsov, Department of Mechanical Engineering, Moscow State University, Moscow, U.S.S.R. (1971)
- pp. 13-17

Their interrelationships of the relations and mutual influence, and proportionally first growth of the volume of information, and an increase in the direction of the flow have given rise to the alternative necessity for forms which is based on the principles of systematical formation of the separate systems, information. One of the most widespread and effective forms of design-aiding information is classification.

At the present time the problem of introducing automatic integrated control systems on all levels of economic activity is being solved on a state scale. The supply of documents for such systems in machine and instrument making is based on a mixed system of classification and coding of technical-economic information the most important component parts of which are the design and technological process classifiers of parts for several machine holding applications.

The design classification of parts for machine and instrument making has been performed within the framework of the All-Union Classifier of the Universal and Agricultural Production (VUP). The highest classification structure of the VUP embraces both commercial and noncommercial production parts and assemblies, and they contain branch and general machine holding systems of machine and instrument making.

The design classification of parts was constructed by the hierarchical principle where successive subdivision of the entire set of parts is carried out from top to bottom by the method of deduction into reciprocal having similar attributes.

The classifier of parts for general machine building application is a summary of moment-occures of the groups of parts combined by the principle of structural similarity. The depth of the classification division numbers five levels: class, subclass, group, subgroup, type.

1/2 025 UNCLASSIFIED PROCESSING DATE--230270
TITLE--COMPONENT CLASSIFICATION FOR UNIFIED SYSTEM OF DESIGNER
DOCUMENTATION -U-
AUTHOR--(04)-KULIK, L.M., SHNAYDMAN, G.M., POGODIN, U.A., VALLER, S.L.
COUNTRY OF INFO--USSR
SOURCE--STANDARTY I KACHESTVO, 1970, NR 4, PP 22-30
DATE PUBLISHED-----70
SUBJECT AREAS--BEHAVIORAL AND SOCIAL SCIENCES
TOPIC TAGS--DESIGN STANDARD, DESIGN FACILITY R AND D MANAGEMENT,
PRODUCTION STANDARD, ENGINEERING STANDARD, DATA PROCESSING SYSTEM
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--1999/0109 STEP NO--UK/0422/70/000/005/0022/0030
CIRC ACCESSION NO--AP0122375
UNCLASSIFIED

2/2 025

UNCLASSIFIED

PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0122375

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ARTICLE PRESENTS A CLASSIFICATIONAL SYSTEM OF DESIGNATIONS FOR PRODUCTS AND DESIGNER DOCUMENTS IN MECHANICAL AND PRECISION ENGINEERING. UNIFICATION OF PRODUCT DESIGNATIONS, INCLUDING THE DESIGNATIONS OF COMPONENT PARTS, IS SUGGESTED AND THEIR CLASSIFICATIONAL CHARACTERISTICS ARE GIVEN. COMPONENT PARTS IN MECHANICAL AND PRECISION ENGINEERING CAN BE CLASSIFIED AS THOSE COMMON FOR ENGINEERING AT LARGE AND THOSE SPECIFIC FOR CERTAIN BRANCHES OF INDUSTRY. FIGS. 5.

UNCLASSIFIED

USSR

UDC 575+581.154

KULIK, M. I., and SHKVARNIKOV, P. K., Sector of Molecular Biology and Genetics of the Institute of Microbiology and Virology, Academy of Sciences Ukrainian SSR, Kiev

"Nature of Modification of Mutagenic Effects Exerted by Fast Neutrons"

Kiev, Tsitologiya i Genetika, Vol 5, No 4, Jul/Aug 71, pp 336-341

Abstract: The mutagenic activity of extracts from dry seeds of peas and wheat that had been irradiated with fast neutrons was determined. The extracts from wheat seeds irradiated with doses of 500-1500 rad, upon acting on non-irradiated wheat seeds that germinated together with the irradiated seeds on the same piece of moist filter paper, increased the frequency of chromosome aberrations in sprouts by a factor of approximately 2.5 compared with that for non-irradiated controls that were not exposed to the action of extracts. The chromosome aberrations were much smaller in number and of a different type than those induced by direct irradiation of the seeds. Similar results were obtained on treatment of germinating pea seeds with extracts from irradiated peas. Extracts from the seed coat and cotyledons of irradiated peas increased the frequency of chromosome aberrations to almost the same extent vs. that of controls, but the types of aberrations were different. This was due to the difference in the chemical constitution of substances contained in the coat and the endosperm. 1.1

- 21 -

USSR

UDC: 681.335.7

YEVDOKIMOV, V. F., YEFIMOV, A. A., ~~KULIK, M. N.~~, Institute of Cybernetics,
Academy of Sciences of the Ukrainian SSR

"A Device for Modeling a System of Differential Equations"

Moscow, Otkrytiya, Izobreneniya, Promyshlennyye Obraztzy, Tovarnyye Znaki,
No 10, Apr 72, Author's Certificate No 332468, Division G, filed 25 Mar 68,
published 14 Mar 72, p 198

Translation: This Author's Certificate introduces a device for modeling
a system of differential equations based on Author's Certificate No 223398.
As a distinguishing feature of the patent, the accuracy of the device is
improved and its operating conditions are moderated by adding filters
whose inputs are connected through the commutator to the output of the
code-controlled converter, while the outputs are connected to the lines
of the matrix of integrating capacitors.

1/1

USSR

UDC 536.2.02.001.57

GUZENKO, A. I., ~~KOLIK, N. N.~~

"The Solution of Equations of the Thermal-Conductivity Type on Electric Integrators With the Use of Quasi-Resistors"

Kiev, Kiberneticheskaya Tekhnika -- Sbornik (Cybernetic Engineering -- Collection of Works), No 1, 1970, pp 65-72 (from Referativnyi Zhurnal, Teploenergetika, No 1, 1971, Abstract No 1G90 by S. A. Prisman)

Translation: For solving equations of the type of $1/ut = a(t)d^2 u/x^2$, a nonlinear electric integrator is proposed. In connection with the necessity of replotting the volt-ampere characteristic an accordance with the type of problem being solved, nonlinear quasi-resistors are used. A quasi-resistor constitutes a two-terminal network, consisting of an ohmic resistance and an adjustable voltage source. The model is balanced manually or automatically. In the case of automatic balancing, the voltages are formed by a functional converter. The distinguishing feature of the electric integrator is the fact that all the nonlinear elements have the same volt-ampere characteristics. The balancing process converges within 4-5 cycles. 4 figures. 4 bibliographic entries.

1/1

AACO44625

UR 0482

Soviet Inventions Illustrated, Section II. Electrical, Derwent,

243272 ADDER of Patent No. 197306 is modified by introducing filters 4, the outside clamps of which are connected with the lead off and through a matrix connected to the adding point of the direct current booster 2, of a high negative coefficient of intensification, a gating circuit 3 and a pairs of filters and resistances.

2/70

25.3.68 as 1227557/14-24. Add to No. 197306, V. F. EVDOKIMOV et al. CYBERNETICS INST ACAD. SCIENCES USSR (17.9.69) Bul 16/5.5.69. Class 42m⁴. Int. Cl. G 06g.

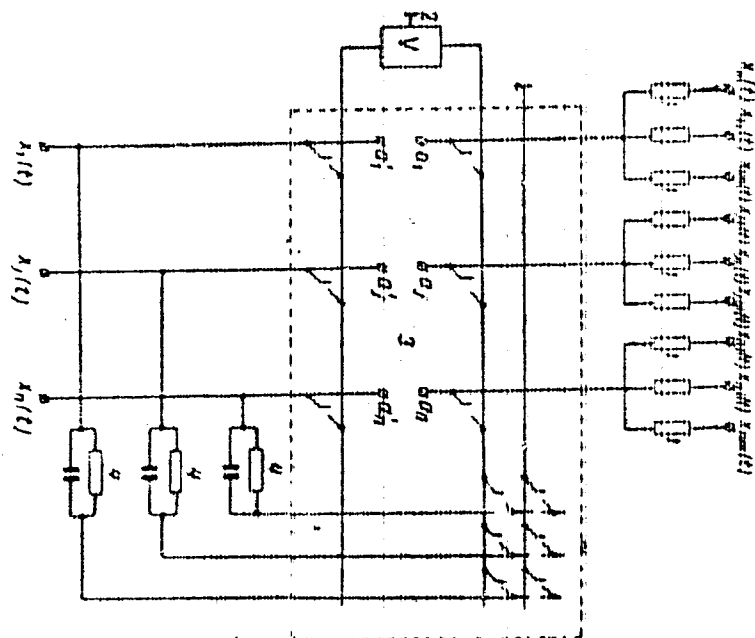
AUTHORS: Yevdokimov, V. F.; Kazakevich, L. A.; Kulik, M. N.;
Institut Kibernetiki AN Ukrainskoy SSR

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19771309

AA0044625



2/2

19771310

8c

1/2 012 UNCLASSIFIED PROCESSING DATE--0200170
TITLE--AN ACCOUNT OF AGROMETEOROLOGICAL CONDITIONS AND YIELD STABILITY -U-

AUTHOR--KULIK, M.S.

R

COUNTRY OF INFO--USSR

SOURCE--METEOROLOGIYA I GIDROLOGIYA, 1970, NR 4, PP 121-129

DATE PUBLISHED-----70

SUBJECT AREAS--ATMOSPHERIC SCIENCES, AGRICULTURE

TOPIC TAGS--METEOROLOGY, AGRICULTURAL CROP YIELD

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1987/1022

STEP NO--UR/0050/70/000/004/0121/0129

CIRC ACCESSION NO--AP0104420

UNCLASSIFIED

2/2 012

UNCLASSIFIED

PROCESSING DATE--02NOV70

CIRC ACCESSION NO--AP0104420

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE ARTICLE PROVES THAT THE UP TO DATE LEVEL OF HUSBANDRY CULTURE AND EXPERIENCE OF AGRONOMETEOROLOGICAL SERVICES IN AGRICULTURE MAKE IT POSSIBLE TO USE QUITE EFFICIENTLY AGRONOMETEOROLOGICAL DATA FOR INCREASE OF YIELD STABILITY. THE POSSIBILITY TO REVEAL ADDITIONAL RESERVES FOR INCREASE OF AGRICULTURAL PRODUCTIVITY BY MORE RATIONAL USE OF CLIMATIC RESOURCES OF OUR COUNTRY IS ILLUSTRATED USING AS AN EXAMPLE THE APPLICATION OF CLEAN FALLOWS AND UTILIZATION OF MINERAL FERTILIZERS TAKING INTO ACCOUNT THE AGRONOMETEOROLOGICAL CONDITIONS.

UNCLASSIFIED

USSR

UDC: 518:517.9:53

GLASKO, V. B., ~~KULIK, N. I.~~, TIKHONOV, A. N., Moscow

"On Determination of a Geoelectric Cross Section Based on the Method of Regularization"

Moscow, Zhurnal Vychislitel'noy Matematiki i Matematicheskoy Fiziki, Vol 12, No 1, Jan/Feb 72, pp 139-149

Abstract: Measurement of the apparent resistance at the surface of the earth is an incorrect approach to the problem of determining a geoelectric cross section. The authors propose an algorithm for solving this problem which is based on the general method of regularization. This algorithm is applicable to a fairly broad class of plane structures, including the case of continuous variation of conductivity, in particular within individual layers. It is shown that if the initial data are sufficiently accurate, the proposed regularizing algorithm enables definition of fairly complicated cross sections with precision which is satisfactory for practical purposes. Five figures, bibliography of fourteen titles.

1/1

1/2 020 UNCLASSIFIED PROCESSING DATE--20NDV70
TITLE--MECHANISM OF THE SIMULTANEOUS REACTION OF BUTYL ISOCYANATE AND
METHANOL WITH AEROSIL -U-
AUTHOR-(05)-KULIK, A.V., NEGIYEVICH, L.A., KURGAN, N.P., MELITSKAYA, G.F.,
KACHAR, A.A.
COUNTRY OF INFO--USSR K
SOURCE--TEKH. EKSP. KHIM. 1970, 6(1), 55-60
DATE PUBLISHED-----70
SUBJECT AREAS--CHEMISTRY
TOPIC TAGS--ORGANIC ISOCYANATE, METHANOL, CHEMICAL REACTION RATE,
ADSORPTION, SILICA
CONTROL MARKING--NO RESTRICTIONS
DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAE--3002/117L STEP NO--UR/0379/70/006/001/0055/0060
CIRC ACCESSION NO--AP0128593
UNCLASSIFIED

2/2 020

UNCLASSIFIED

PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0128593

ABSTRACT/EXTRACT--(U) CP-0- ABSTRACT. REACTION RATES WERE MEASURED OF URETHANE (I) FORMATION FROM BUNCO (II) AND MEDH IN THE GAS PHASE ON AEROSIL. THE HIGHEST RATE WAS ACHIEVED BY INTRODUCING A MIXT. OF MEDH AND II INTO THE CATALYST, DUE TO COMPLEX FORMATION. A LOWER RATE WAS OBTAINED ON INTRODUCING II FIRST. INTRODUCTION OF MEDH FIRST LED TO THE LOWEST RATE DUE TO BLOCKING OF SILANOL GROUPS OF THE CATALYST BY MEDH ADSORPTION. FACILITY: INST. KHIM. VYSOKOMOL. SUDEN., KIEV, USSR.

UNCLASSIFIED

1/2 021
 TITLE--THERMAL DECOMPOSITION OF NITRIDES OF SOME TRANSITION METALS IN AIR
 -U-
 AUTHOR--(03)-LYUTAYA, M.O., KULIK, G.P., KACHKOVSKAYA, E.T.
 COUNTRY OF INFO--USSR
 SOURCE--POROSH. MET., AKAD, NAUK UKR. SSR; NO. 3, 72-4
 DATE PUBLISHED----MAR 70

PROCESSING DATE--04DEC70

K

SUBJECT AREAS--CHEMISTRY, MATERIALS

TOPIC TAGS--THERMAL DECOMPOSITION, TRANSITION METAL, TITANIUM, NITRIDE, ZIRCONIUM NITRIDE, VANADIUM, HAFNIUM, CHROMIUM

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
 PROXY REEL/FRAE--3002/0096

STEP NO--UR/0226/70/000/001/0072/0075

ACCESSION NO--AP0127722
 UNCLASSIFIED

PROCESSING DATE--04DEC70

UNCLASSIFIED

2/2 021
CIRC ACCESSION NO--AP0127722
ABSTRACT/EXTRACT--(U) GP-0-

ABSTRACT. THE THERMAL DECOMPOSITION IN THE
AIR OF TITANIUM NITRIDES WITH ULTIMATE COMPOSITION AND IN THE
HOMOGENEITY REGION AND NITRIDES OF ZIRCONIUM, HAFNIUM, VANADIUM, AND
CHROMIUM WAS INVESTIGATED BY THERMOGRAPHIC, CHEMICAL, AND X RAY METHODS.
THE DECOMPOSITION OF TITANIUM NITRIDE STARTED AT 600DEGREESC. THE
DECOMPOSITION OF TITANIUM, ZIRCONIUM, HAFNIUM, VANADIUM, AND CHROMIUM
NITRIDES AT CORRESPONDING TEMPERATURES UP TO THE HIGHEST OXIDES OCCURRED
THROUGH THE FORMATION OF INTERMEDIATE COMPOUNDS OF VARIABLE COMPOSITION.
(AUTH).
FACILITY: INST. OF PROBLEMS IN MATERIAL STUDIES, KIEV.

UNCLASSIFIED

UDC: 533.938

USSR

KULIK, V. Ya., KULIK, P. P., RYABYY, V. A., Moscow Aviation Institute
imeni S. Ordzhonikidze

"Diffusion Cross Section of Scattering of Electrons by Cesium Atoms"

Moscow, Teplofizika Vysokikh Temperatur, Vol 10, No 4, Jul/Aug 72, PP
715-723

Abstract: The electrical conductivity of a weakly ionized cesium plasma is measured to determine the effective electron-cesium atom diffusion cross section at temperatures between roughly 1000 and 2000°K where there is the greatest uncertainty as to the diffusion cross section of cesium. An attempt is made to systematize published theoretical and experimental data on the electron-cesium atom diffusion cross section by analysis within the framework of the Chapman-Eskog kinetic theory. Satisfactory mutual agreement is observed between the most creditable experimental data and the predictions of scattering theory. The authors thank E. M. Karule, R. K. Peterkop and other staff members of the Department of Theoretical Physics of the Institute of Physics, Academy of Sciences of the Latvian SSR, and also L. A. Vaynshteyn for constructive criticism on the problems dealt with in the paper.

1/1

- 57 -

UDC 621.791:539.378.3:62-225:62.19

USSR

KULIK, S. G., KAMINSKIY, A. M., and OZEROV, Ye. A., Engineers, and
KVASNITSKIY, V. F., Candidate of Engineering Sciences

"Effectiveness of Nozzle Blades Made by Diffusion Welding Through an
Intermediate Layer"

Moscow, Svarochnoye Proizvodstvo, No 1, Jan 73, pp 32-34

Abstract: The purpose of this work was to investigate the efficiency of full-scale nozzle blades produced by vacuum-diffusion welding through an intermediate metal layer. The usual method of welding, in which the metals being joined are melted, such as high-alloy heat-resistant alloys EP99, VKh4A, EI602, etc., results in the formation of hot cracks in the seam metal and heat-affected zone. For intermediate layers VPr7 and VPr11 brazing alloys and IKh18Ni9Ti steel were used which were 0.1 mm thick.

The welded blades were subjected to both thermal cycling and mechanical loads of 3000 cycles and 16 or 22 kgf/mm², respectively. Results of these tests showed that damage characteristic of thermal fatigue was not detected when the samples were subjected only to thermal cycling; however, when subjected

USSR

KULIK, S. G., et al., Svarochnoye Proizvodstvo, No 1, Jan 73, PP 32-34
to both conditions the samples exhibited some cleavage. Of the three ma-
terials tested as intermediate welding strips, 1Kh18N9T steel showed the
best results, with VPr7 brazing alloy coming in last. Five figures, 1
table, 4 bibliographic references.

2/2

1/2 013

TITLE--EFFECT OF TMD BASED PREPARATIONS ON THE SOWING QUALITY OF CORN
DURING LONG TERM STORAGE -U-
AUTHOR--(02)-ANDREYEVA, YE.I., KULIK, T.A.

PROCESSING DATE--040201

COUNTRY OF INFO--USSR

SOURCE--KHIM. SEL. KHOZ. 1970, 8(3), 193-5

DATE PUBLISHED-----70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--FUNGICIDE, AGRICULTURE CROP SEED, CEREAL CROP, PLANT DISEASE CONTROL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3004/0180

STEP NO--UR/0394/70/003/003/0193/0195

CIRC ACCESSION NO--AP0130939

UNCLASSIFIED