

SHCHUKAREV, S.A.; SEMENOV, G.A.; RAT'KOVSKIY, I.A.

Determination of the pressure of gallium oxide saturated vapor.  
Zhur.neorg.khim. 6 no.8:1973 Ag '61. (MIRA 14:8)  
(Gallium oxide) (Vapor pressure)

30283  
S/078/61/006/012/011/311  
B124/B110

S 2200  
AUTHORS:

Shchukarev, S. A., Semenov, G. A., Rat'kovskiy, I. A.

TITLE:

Determination of the saturated vapor pressure of thallium oxide

PERIODICAL:

Zhurnal neorganicheskoy khimii, v. 6, no. 12, 1961, 2817-2818

TEXT: The pressure of saturated  $Tl_2O_3$  vapor was measured using flow in an oxygen atmosphere. Thallous oxide was prepared by solving the pure metal in  $HNO_3$  and additional oxidation by means of bromine water; excess bromine was removed by boiling. Thallium hydroxide was precipitated with ammonia and converted by boiling under water to the crystalline form.  $Tl_2O_3$  was subsequently dried in a current of dry oxygen at 250°C for 4 hours. The temperature of the boat in the furnace was measured with a Pt-PtRh thermocouple equipped with the potentiometer  $MM-1$  (PP-1). The velocity of the carrier-gas current corresponding to saturation with  $Tl_2O_3$  vapors was measured at 670, 700 and 750°C. When extrapolation to

Card 1/3

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Determination of the...

zero velocity was performed, the change in molar concentration was made no allowance for at rates of flow below 3 ml/min., since considerable deviations were found to occur at these rates. A rate of flow equal to 3 ml/min was chosen, with maximum deviation of the extrapolated molar concentrations of  $Tl_2O_3$  from measured values being 4%. Experimental data obtained

are illustrated in the Figure; they are described in good approximation by the equations:  $Tl_2O_3 \xrightarrow{sol} Tl_2O_3 \xrightarrow{gas}$   $\log p = -(12,196/T) + 13.440$  and

$Tl_2O_3 \xrightarrow{liq} Tl_2O_3 \xrightarrow{gas}$   $\log p = -(11,429/T) + 12.663$ .  $Tl_2O_3$  was supposed to be present in the vapor in monomer form. Sublimation enthalpies of thallium

oxide calculated from the slope of the straight line  $\log p = f(1/T)$  were  $55.8 \pm 1$  kcal/mole and  $52.3 \pm 1$  kcal/mole, respectively, sublimation entropies  $48.3 \pm 1$  kcal/mole-degree and  $44.9 \pm 1$  kcal/mole-degree, respectively, the melting point  $716 \pm 20^\circ C$ , the boiling point  $11690^\circ$ , the heat of vaporization at boiling temperature  $50.0 \pm 1$  kcal/mole, and the heat of fusion  $3.5 \pm 1$  kcal/mole. There are 1 figure and 5 references: 2 Soviet and 3 non-Soviet. The two references to English-language publications read as follows: A. B. F. Duncan, J. Amer. Chem. Soc. 51, 2697

Card 2/3

30189

S/078/61/006/012/011/011  
B124/B110

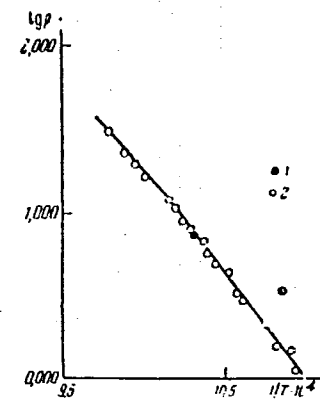
Determination of the...

(1929); L. Brewer, Chem. Rev. 52, 1 (1953).

SUBMITTED: June 8, 1961

Fig. Temperature dependence of the saturated-vapor pressure of thallic oxide. 1 - Data published by V. I. Bibikova and M. I. Vasilevskaya [abstracter's note: I. M. Vasilevskaya in the bibliographical list] (Ref. 4: Sb. nauchn trudov, vol. 1, Giredmet, 1959); 2 - Data published by the authors of this paper.

Fig.



Card 3/3

21420  
S/079/61/031/007/002/008  
D229/D305

52200

AUTHORS:

Shchukarev, S.A., Semenov, G.A., Rat'kovskiy, I.A.,  
and Perevoshchikov, V.A.

TITLE:

Determination of saturated vapor pressures of indium  
oxide

PERIODICAL: Zhurnal obshchey khimii, v. 31, no. 7, 1961,  
2090 - 2092

TEXT: This is a report on determining very low saturated vapor  
pressure of indium oxide by the flow method using a radioactive  
tracer - In114 in the range of temperature from 1290° to 1490°. It  
is known (Ref. 1: S.V. Bleshinskiy, and V.F. Abramova, Khimiya in-  
diya. Izd. AN Kirgizsk SSSR, 1958) that the ignition of In2O3 at  
the temperature up to 1200° did not lead to a change in weight of  
indium oxide. The attempt to measure the vapor pressure of In2O3  
at 1060° using the flow method was unsuccessful. In view of the  
above it was decided to determine vapor pressure of In2O3 by a

Card 1/4

Determination of saturated ...

24120  
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D229/D305

Fig. 2. Relationship between  $\frac{1}{T}$  and  $\log p$ .

Legend: Dependence of saturated vapor pressure of  $\text{In}_2\text{O}_3$  on temperature.

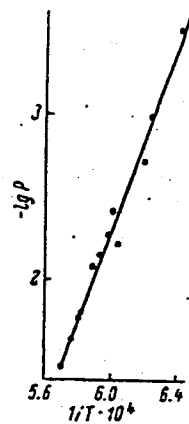


Рис. 2. Зависимость давления насыщенного пара  $\text{In}_2\text{O}_3$  от температуры.

Card 4/4

S/O20/61/141/003/011/021

03/B101

55510

AUTHORS: Shchukarev, S. A., and Semenov, G. A.

TITLE: Mass-spectrometric study of the vapor composition above rare-earth oxides

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 141, no. 3, 1961, 652-654

TEXT: The vapor composition above the oxides of all rare earth elements (except Tu) was studied in a MM-1305 (MI-1305) mass spectrometer with vaporization from an iridium band. The thermocouple used in the spectrometer was gaged by means of an optical pyrometer of the 1st type in the Laboratoriya vysokikh temperatur Vsesoyuznogo nauchno-issledovatel'skogo instituta metrologii im. Mendeleeva (Laboratory of High Temperatures of the All-Union Scientific Research Institute of Metrology imeni Mendeleev). It is recommended to take into account the simultaneous formation of ions having equal mass by direct ionization of neutral particles when setting out to obtain quantitative data on the ratio of the partial pressures of the vapor components. Such ions may also form by dissociative ionization of heavier molecules. The authors criticize the

Card 1/04

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S/020/61/141/003/011/021  
B103/B101

Mass-spectrometric study ...

X

assumption by M. B. Panish (Ref. 4, see below) according to which the interrelation of ionic currents in the mass spectrum at an ionizing voltage of 20 v corresponds to the interrelation of the concentrations of the corresponding neutral molecules in the vapor. On the one hand, an arbitrary choice of electron energy may result in considerable dissociative ionization, and on the other, the efficiency of the ionization of certain molecules, especially those of the MO<sub>2</sub> type, may be extremely low. The potentials of ion formation were estimated for all the oxides. The scale of the ionizing voltage was corrected using the ionization potentials of argon and mercury as a basis. Then the initial sections of the curves of ionization efficiency were extrapolated from the time of beginning formation of ion fragments unto the ionic current peak, since here the current strength depends little on the electron energy. The interrelation of the ionic currents at the maximum efficiency, corrected for the ratio of the effective ionization cross sections (Ref. 6, see below) corresponds to the interrelation of the concentrations of the neutral particles. The results are represented in Table 1. In each experiment the maximum ionic current was taken as unit. The measurements were carried out at temperatures sufficiently high to attain

Card 2/5



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B103/B101

Mass-spectrometric study ...

a vapor pressure of  $10^{-5}$  mm Hg of the major component. Modifications of the Langmuir method were used for  $\text{La}_2\text{O}_3$  and  $\text{Nd}_2\text{O}_3$ . With other oxides, the vapor pressure was determined during simultaneous vaporization of equimolar quantities of the oxide in question and  $\text{La}_2\text{O}_3$ . Above  $\text{Er}_2\text{O}_3$  and  $\text{Yb}_2\text{O}_3$ , the vapor pressure of the metals was measured. It was found that the volatility of the oxides of the individual elements in a high vacuum and the composition of their vapors vary widely. The stability of the gaseous monoxides of the lanthanide series, on passing from La to Lu compounds, shows a general tendency to decrease. This results in an increasing  $\text{M}^+/\text{MO}^+$  ratio. This regularity is strictly periodical. The latter ratio is highest for elements having a valency +2 (Eu, Yb), and a lowest sublimation enthalpy of the metal. These oxides are also more volatile. Dioxide molecules ( $\text{CeO}_2$ ,  $\text{PrO}_2$ ,  $\text{TbO}_2$ ) were found to be present in the vapors of elements having the valency +4. This was also found to be the case in check tests carried out in a spectrometer with a tungsten band, as the ionic currents of  $\text{Ir}^+$  and  $\text{TbO}_2^+$  cannot be separated in the MI-1305 instrument. On heating in a vacuum,  $\text{CeO}_2$  dissociates into about

Card 3/6

Mass-spectrometric study ...

30723  
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$\text{CeO}_{1.80}$ - $\text{CeO}_{1.67}$ . (Ref. 8, see below). The vapor of this oxide contains  $\text{CeO}$  and  $\text{CeO}_2$  molecules. The ratio of the ionic currents  $\text{CeO}^+/\text{CeO}_2^+$  does not remain constant, but increases gradually as the quantity of substance on the vaporizer band decreases, i.e. from 0.5 : 1.0 at the outset to 0.8 : 1.0 at the end of the test (ionizing voltage 45 v).  $\text{CeO}_3$  was found to vaporize congruently at a solid phase composition of approximately  $\text{CeO}_{1.6}$ . Formation of ions of the type  $\text{M}_2\text{O}_2^+$ , or polymeric ions  $(\text{MC})_n$  was not observed. There are 2 figures, 1 table, and 8 references: 2 Soviet and 6 non-Soviet. The three most important references to English-language publications read as follows: Ref. 4: M. B. Panish, J. Chem. Phys., 34, 1079 (1961); Ref. 6: J. M. Ooms, D. P. Stevenson, J. Am. Chem. Soc., 78, 546 (1956); Ref. 8: G. Braner, K. A. Gingerich, H. Holschmidt, J. In. Nucl. Chem., 16, 77 (1960).

PRESENTED: June 26, 1961, by A. N. Terenin, Academician

SUBMITTED: June 23, 1961

Card 4/5

S/153/62/005/005/001/011  
E071/E133

AUTHORS: Shchukarev, S.A., Semenov, G.A., and Frantseva, K.Ye.

TITLE: A mass spectrometric study of the evaporation of NbO

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Khimiya i khimicheskaya tekhnologiya, v.5, no.5, 1962, 691-693

TEXT: Niobium monoxide for the investigation was obtained by the reduction of pure niobium pentoxide (99.96%) in dry hydrogen. A specimen of NbO was placed on a tungsten or iridium strip in the ionic source of a mass spectrometer MП-1305 (MI-1305). The temperature was measured with a calibrated tungsten-rhenium thermocouple welded to the strip. The presence in the vapour of the following ions was established:  $Nb^+$ ,  $NbO^+$  and  $NbO_2^+$ . In order to determine the origin of  $NbO^+$  ions, the potential of their appearance was evaluated by plotting the dependence of ionic current  $NbO^+$  against the ionising potential. This was evaluated as 10.5 eV. Complete absence of  $Nb^+$  ions at an ionising potential of 15 V indicated that these were formed due to dissociation of neutral molecules present in the vapour  $NbO_2$  and NbO.

Card 1/2

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B110/B138

Determination of the saturated...

condensate deposited on target, imp/min;  $q_{st}$  = weight of initial radio-  
active substance in the sample, g; radius of collimator, cm;  $h$  = distance  
between effusion chamber and collimator, cm;  $T$  = temperature of effusion  
chamber, °K;  $M$  = molecular weight of the vapor of the substance examined.  
An  $\text{MC-1 (MS-1)}$  mass spectrometer was used to determine the composition of  
Tl vapor during evaporation from an open surface, at an ionization voltage  
of 50-60 v, and an emission current of 1.2 ma.  $\text{Tl}^+$ ,  $\text{Tl}^{2+}$ ,  $\text{Tl}_2\text{O}^+$ ,  $\text{O}_2^+$ , and  
 $\text{Tl}_2^+$  ions were found in a ratio of 100:10:2:1:1. The  $\text{Tl}_2\text{O}^+$  and  $\text{Tl}_2^+$  currents

decreased rapidly with time, but their ratio remained constant and  
temperature-independent.  $\text{Tl}_2\text{O}^+$ ,  $\text{O}_2^+$ , and  $\text{Tl}_2^+$  are probably the result of the  
dissociation of oxide films forming on the surface. This is in good agree-  
ment with mass-spectrometer examinations of Ga and In evaporation. Like  
Ga and In ( $\text{Me}_2/\text{Me} = 10^{-3}$ ), Tl vapor is also assumed to have a monomer  
structure. Tl metal with  $\text{Tl}^{204}$  was reduced for 4-5 hrs in  $\text{H}_2$  current at  
250°C, and vacuum heated for 3-4 hrs at  $< 700^\circ\text{C}$ . Temperature dependence

Card 2/3

S/080/62/035/007/001/013  
D257/D304AUTHORS: Shchukarev, S.A., Semenov, G.A. and Rat'kovskiy, I.A.

TITLE: Study of the evaporation of gallium, indium and thallium by means of a mass spectrometer

PERIODICAL: Zhurnal prikladnoy khimii, v. 35, no. 7, 1962,  
1454-1459

ABSTRACT: In view of the increasing use of these metals in science and engineering the vapor composition above  $Ga_2O_3$ ,  $Tl_2O_3$ ,  $In_2O_3$  and  $In_2O$  has been studied, the method used being essentially that described by W. Aldrich. Honig's method of evaluating the potential of generation of various ions was used to determine their nature (ionization of neutral particles vs. dissociation ionization). The sesquioxides were obtained from pure metals via chlorides and hydroxides.  $In_2O$  was obtained from indium oxalate by decomposition at  $535^{\circ}C$ ; X-ray analysis of this oxide showed only the lines of  $In_2O_3$  and  $In$ . The mass spectra of the vapors of  $Ga_2O_3$  (at  $1150 -$

Card 1/2

Study of the evaporation of gallium, ... S/088/62/035/007/001/013  
D267/5304

1450°C),  $\text{In}_2\text{O}_3$  (1400 - 1450°C) and  $\text{Tl}_2\text{O}_3$  (500 - 800°C) were characterized by the complete absence of ionic currents corresponding to  $\text{M}_2\text{O}$  (where M = metal) and by the presence of intensive currents of  $\text{O}_2^+$ ,  $\text{M}^+$  and  $\text{M}_2\text{O}^+$  (in this sequence of decreasing intensities). Besides, a current corresponding to  $\text{GaO}^+$  (and a very feeble current corresponding to  $\text{InO}^+$ ) was observed. The following scheme of decomposition was adopted: (1)  $\text{M}_2\text{O}_3 \rightleftharpoons \text{MO} \rightarrow \text{M}_2\text{O} \rightarrow \text{MO} + \text{O}_2$ ;  
(2)  $\text{M}_2\text{O}_3 \rightarrow \text{MO}_{\text{solid}} + \text{O}_2$ ; (3)  $\text{MO}_{\text{solid}} \rightarrow \text{M}_2\text{O}_{\text{solid}} + \text{M}_2\text{O}_{3\text{solid}} + \text{O}_2$ ;  
(4)  $\text{M}_2\text{O}_{\text{solid}} \rightarrow \text{M}_2\text{O}_{\text{gas}}$ ; (5)  $\text{M}_2\text{O}_{\text{gas}} \xrightarrow{+e} \text{M}_2\text{O}^+$ ;  
(6)  $\text{M}_2\text{O}_{\text{solid}} \rightarrow \text{M}_{\text{solid}} + \text{O}_2$ ; (7)  $\text{M}_{\text{solid}} \xrightarrow{+e} \text{M}_{\text{gas}}^+$ . There are 4 figures and 1 table. The most important of the English-language references reads as follows: I. Antkiv and V. Dibeler, J. chem. Physics, 21, 1390 (1953). ✓

SUBMITTED: May 25, 1961

Card 2/2

38962  
S/020/62/145/001/016/018  
B145/B101

21.2100

AUTHORS: Shchukarev, S. A., Semenov, G. A., and Frantseva, K. Ye.

TITLE: Determination of the saturation vapor pressure of niobium dioxide

PERIODICAL: Akademiya nauk SSSR. Doklady, v. 145, no. 1, 1962, 119 - 121

TEXT: The saturation vapor pressure of niobium dioxide was measured in the range 1938 - 2122°K using a variant of Knudsen's effusion method (see T. E. Phipps, C. W. Sears, O. C. Simpson, Manhattan Project, D.v. IV, 14b, The Transuranium Elements, N. Y., 1949, p. 704, and An. N. Nesmeyanov, Atomnaya energiya, 3, 227 (1957)), and the heat of sublimation and the dissociation energy of gaseous NbO<sub>2</sub> were calculated from the results. The

cylindrical effusion chamber was of forged molybdenum (diameter of the effusion opening: 0.308 mm, ratio between the areas of the material to be vaporized and the effusion opening = 500 : 1; heating by electron bombardment; attainable vacuum: 1·10<sup>-5</sup> mm Hg; 2100°K). The oxide has the composition NbO<sub>2.008</sub> and was tagged with Nb<sup>95</sup>. The values measured satis-

Card 1/2

S/020/62/145/001/016/018  
B145/B101

Determination of the saturation ...

fied the equation  $-\log P = -30300/T + 12.42$  mm (heat of sublimation:  $138 \pm 2$  kcal/mole). From the published values of  $-(F_T^0 - H_{298}^0)/T$  and of  $H_{298}^0 - H_0^0$  for condensed and gaseous  $NbO_2$ , the sublimation enthalpy  $\Delta H_0^0$  was calculated as  $141 \pm 0.4$  kcal/mole. The dissociation energy of gaseous  $NbO_2$ , calculated from published data for the heat of sublimation of metallic Nb and the heat of atomization, worked out as  $14.9 \pm 0.1$  ev. There are 2 figures and 1 table. The most important English-language references are: J. L. Margrave, Proc. of the Symposium on High Temperature - a Tool for the Future, Berkeley, California, 1956; Physicochemical Measurements at High Temperatures, Ed. Bockris, White, Mackenzie, Butterworths Sci. Publ., 1959; L. Brewer, G. M. Rosenblatt, Chem. Rev., 61, 3 257 (1961).

ASSOCIATION: Leningradskiy gosudarstvennyy universitet im. A. A. Zhdanova  
(Leningrad State University imeni A. A. Zhdanov)

PRESENTED: March 3, 1962, by A. N. Terenin, Academician

SUBMITTED: February 27, 1962  
Card 2/2



NEFEDOV, V.D.; KIRIN, I.S.; ZAYTSEV, V.M.; SEMENOV, G.A.; DZEVITSKIY, B.E.

Use of multiple tagged compounds in the study of the mechanism of  
antimony isotopic exchange in its methyl derivatives. Zhur.ob.khim.  
33 no.7:2407-2410 J1 '63. (MIRA 16:8)  
(Antimony organic compounds) (Deuterium compounds)  
(Antimony isotopes)

L 38508-65 EPF(c)/EPF(n)-2/EPI/ENG(j)/EWT(m)/EWP(b)/EWP(t) Pr-l/Ps-l/Pu-l  
IJP(c) WJ/JW/JD/JG/GS

S/0990/63/000/000/0228/0232

ACCESSION NR: AT5007738

AUTHOR: Semenov, G.A.

TITLE: A mass-spectroscopic study of the vaporization of oxides

SOURCE: AN SSSR. Institut khimii silikatov. Silikaty i oksidy v khimii vysokikh temperatur (Silicates and oxides in high-temperature chemistry). Moscow, 1963. 228-232

TOPIC TAGS: mass spectroscopy, oxide vaporization, rare earth oxide, oxide vapor pressure, niobium dioxide

ABSTRACT: Using the method of vaporization from an open surface, the authors studied the composition of the vapor over a whole series of oxides, including rare earth oxides, at the Laboratoriya neorganicheskoy khimii khimicheskogo fakul'teta Leningradskogo Gosudarstvennogo Universiteta (Inorganic Chemistry Laboratory, Chemistry Department, Moscow State University). A specially designed vaporizer (with operating temperatures up to 2200C) was placed in the ion source of an MI-1305 mass spectrometer. The vapor pressure of the analyzed substance was measured by the magnitude of the ion current recorded in the mass spectrometer. The oxides of scandium, lanthanum, and neodymium form the monoxides and atomic oxygen on vaporizing, no other species being present.

Card 1/2

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ACCESSION NR: AT5007738

The dioxides were detected in small amounts over praseodymium and terbium oxide. As the atomic number of the rare earths increases, the gaseous monoxides become increasingly unstable, forming free metals in the vapor. Barium, vanadium, and uranium oxide vaporize without dissociating. Gallium, indium, and thallium oxide are extensively dissociated into molecular oxygen, free metals and lower oxides. Hafnium and thorium oxide dissociate into the lower oxide and atomic oxygen. With the aid of the SKB Analiticheskogo priborostroyeniya AN SSSR (SKB of Analytical Instrument Design, AN SSSR), a special mass spectrometer was constructed for the study of vaporization processes under conditions of equilibrium between the vapor and the condensed phase. It was used to measure the pressure and composition of the vapor over niobium dioxide. Under conditions of thermodynamic equilibrium, in addition to NbO<sub>2</sub>, niobium monoxide was found to be present (8% at 2000C). Orig. art. has: 2 tables.

ASSOCIATION: none

SUBMITTED: 0000063 ENCL: 00

SUB CODE: IC, GC

NO REF SOV: 008 OTHER: 002

Card 2/2 mb

SEMENOV, G.A.; GAVRYUCHENKOV, F.G.

Mass spectra of vapors in the system  $\text{ErCl}_3 - \text{KCl}$ . Zhur.neorg.khim. 9  
no.1:224 Ja '64. (MIRA 17:2)

1. Leningradskiy gosudarstvennyy universitet.

L 00271-0; ... EWP(e) / EWP(t) / ETI IJP(e) AT/WI/JD/WI/JW/JG/GD  
 ACC NR: AT6027148 (N) SOURCE CODE: UR/0000/65/000/000/0208/0214

AUTHOR: Shchukarev, S. A.; Semenov, G. A.

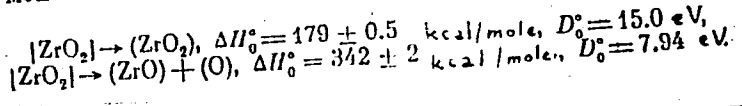
ORG: none

TITLE: Mass-spectrometric study of the vaporization of zirconium, hafnium and thorium dioxides

SOURCE: AN SSSR. Otdeleniye obshchey i tekhnicheskoy khimii. Issledovaniya v oblasti khimii silikatov i okislov (Studies in the field of chemistry of silicates and oxides). Moscow, Izd-vo Nauka, 1965, 208-214

TOPIC TAGS: zirconium compound, hafnium oxide, thorium compound, vapor pressure, vaporization, enthalpy, gas dissociation

ABSTRACT: The purpose of the work was to refine data on the composition of vapors over  $ZrO_2$ ,  $HfO_2$  and  $ThO_2$  and measure the partial pressures of the vapor components under conditions of thermodynamic equilibrium between the vapor and the condensed phase. A tungsten effusion chamber was used, and mass spectra of the oxide vapors were recorded at 15, 40 and 70 eV. The enthalpies of vaporization and energies of dissociation of the gaseous molecules were calculated:



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B+1

Card 1/2

L 6969-66 EPA(s)-2/EWT(m)/EPF(c)/ETC/EPF(n)-2/EWG(m)/EWP(t)/EWP(b) IJP(c) JD/  
ACC NR: AP5028203 WW/JG SOURCE CODE: UR/0079/65/035/009/1517/1521

AUTHOR: Semenkov, G. A.; Ovchinnikov, K. V.

ORG: Leningrad State University (Leningradskiy gosudarstvennyy universitet)

TITLE: Composition of the vapor over rhenium oxides

SOURCE: Zhurnal obshchey khimii, v. 35, no. 9, 1965, 1517-1521

TOPIC TAGS: rhenium compound, ion current, mass spectrum, heat of reaction

ABSTRACT: The vapor composition over the pure oxides  $ReO_3$  and  $ReO_2$  was determined from data on the mass spectrum of evaporation products of these compounds. The evaporation was carried out with a platinum effusion chamber, the design and operation of which are described. The following ions were identified:  $Re_2O_7^+$ ,  $Re_2O_6^+$ ,  $Re_2O_5^+$ ,  $Re_2O_4^+$ ,  $HReO_4^+$ ,  $HReO_3^+$ ,  $ReO_3^+$ ,  $ReO_2^+$ ,  $ReO^+$ ,  $Re^+$ . The nature of the change in mass spectrum with decreasing energy of ionizing electrons indicates that the vapor composition over  $ReO_2$  and  $ReO_3$  is qualitatively the same: the only molecules present are  $Re_2O_7$ ,  $ReO_3$ , and  $HReO_4$ . The reactions occurring during evaporation of  $ReO_2$  are assumed to be

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Card 1/2

UDC: 546.719 : 536.422.1 + 543.51  
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Card 2/2

L 11,212-66 EWP(m)/EWP(h)/EWP(t) IJP(c) DS/JD/JG  
ACC NR: AP6003644 SOURCE CODE: UR/0078/65/010/010/2390/2391

AUTHOR: Semenov, G. A.

ORG: Leningrad State University (Leningradskiy gosudrastvennyy universitet)

TITLE: Mass spectrometric study of the vaporization of scandium oxide

SOURCE: Zhurnal neorganicheskoy khimii, v. 10, no. 10, 1965, 2390-2391

TOPIC TAGS: vapor pressure, scandium compound, ion current, mass spectrometry, heat sublimation, gas ionization

ABSTRACT: The vaporization of  $Sc_2O_3$  from tungsten effusion chambers was studied. In the mass spectrum of the vapor at equilibrium with the solid at  $2550^\circ K$ , at an ionizing voltage of 10 v, ion currents  $Sc^+$  and  $ScO^+$  in the ratio 1:8 were recorded. The formation of  $Sc^+$  ions at such a low energy of ionizing electrons indicates that they are formed by simple ionization of Sc atoms present in the vapor. The appearance potentials of  $Sc^+$  and  $ScO^+$  were found to be 7 and 5.5 ev respectively. The temperature dependence of the current of  $ScO^+$  was measured at 2400-2570°K, and the corresponding vapor pressures of  $ScO$  were calculated by determining the intensity of the current of  $ScO^+$  at the temperature

UDC: 546.633 : 543.51

Card 1/2

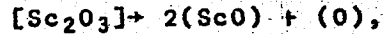
L 11212-66

ACC NR: AP6003644

at which the ScO vapor pressure was measured by isothermal vaporization. The ScO vapor pressure over solid Sc<sub>2</sub>O<sub>3</sub>, assuming a congruent vaporization at a stoichiometric composition, is expressed by the equation

$$\log p = \frac{32800}{T} + 10.47 \text{ mm Hg.}$$

The heat of sublimation of Sc<sub>2</sub>O<sub>3</sub> according to the equation



the dissociation energy of gaseous scandium monoxide, and the thermodynamic potentials  $\phi^*$  for gaseous ScO were calculated. The author thanks G. A. Khachkuruzov for assistance in processing the results. Orig. art. has: 1 figure, 1 formula.

SUB CODE: 07/    SUBM DATE: 06Apr65/    ORIG REF: 003/    OTH REF: 007

TS  
Card 2/2



ACC NR: AP6019043

(A)

SOURCE CODE: UR/0073/66/011/002/0233/0236

AUTHOR: Snenukarov, S. A.; Somenov, G. A.; Frantseva, Z. Ye.

ORG: Leningrad State Order of Lenin University im. A. A. Zhdanov (Leningradskiy gosudarstvennyy ordena Lenina universitet)

TITLE: Thermodynamic study of evaporation of the lower oxides of niobium

SOURCE: Zhurnal neorganicheskoy khimii, v. 11, no. 2, 1966, 233-236

TOPIC TAGS: niobium compound, thermodynamic analysis, mass spectrometry, x ray analysis, heat of dissociation, *EVAPORATION*

ABSTRACT: This is a continuation of the previous works of the authors on the evaporation of Nb oxides (Zh. neorg. khimii, 4, 2638, 1959; Izv. vyssh. uchebn. zaved. Khim. i khim. tekhnologiya, 5, 691, 1962; and Dokl. AN SSSR, 145, 119, 1962) attempting to evaluate quantitatively the parameters of the processes accompanying the evaporation of NbO and NbO<sub>2</sub> and consisting of measuring the vapor pressure by the effusion method with simultaneous mass-spectrometric analysis of the products of evaporation. The study of the evaporation of NbO at 1600-2200C under equilibrium conditions substantiated the conclusions of the previous works regarding the presence of NbO and NbO<sub>2</sub> molecules in the gas phase. At temperatures of >2300C Nb<sup>+</sup> ions were observed in the effusion chamber after complete disappearance of the ion currents of NbO<sub>2</sub><sup>+</sup> and NbO<sup>+</sup>. The heat of sublima-

Card 1/3

UDC: 546.882.2/.5-31 : 536.7

ACC NR: AP6019043

tion of Nb ( $\Delta H_{298}^{\circ} = 173$  kcal/g-at), which agreed well with the literature data (17.8 kcal/g-at), was determined from the angular coefficient of the curve  $\log(I^+ \cdot T) = f(1/T)$  plotted after measuring the dependence of the intensity of  $Nb^+$  on temperature. X-ray phase analysis of the residue left after evaporation detected the presence of NbO and Nb and no NbO<sub>2</sub> in the solid phase. Therefore, the evaporation of NbO consisted of the following reactions:  $NbO_{solid,liquid} \rightarrow (NbO)$  and  $2NbO_{solid,liquid} \rightarrow (NbO_2) + [Nb]$ . The part of each reaction in the evaporation of NbO was determined as  $\sigma_{NbO} : \sigma_{NbO_2} = 2 : 1$ . During evaporation of NbO<sub>2</sub> at 1500 - 2100C, the mass spectrum indicated the presence of predominant NbO<sub>2</sub> and subordinate NbO in amounts varying from fractions of 1% at 1500C to 7-8% at 2200C. The x-ray phase analysis detected only NbO<sub>2</sub> in the solid phase. It was thus concluded that two reactions were present during the evaporation of NbO:  $NbO_{2, solid,liquid} \rightarrow (NbO_2)$  and  $NbO_{2, solid,liquid} \rightarrow (NbO) + (O)$ . The vapor pressures of the gas components of these two reactions were measured. The results agreed (with 5% accuracy) with data from previous investigations. The heat of sublimation of the NbO and NbO<sub>2</sub> molecules and the energies of their dissociation were calculated for NbO<sub>2</sub> as  $\Delta H_{10}^{\circ} = 59.5 \pm 1$  kcal/mole and  $D_0^{\circ} = 14.8 \pm 0.1$  ev and for NbO as  $\Delta H_{10}^{\circ} = 49.5 \pm 1$  kcal/mole and  $D_0^{\circ} = 7.8 \pm 0.1$  ev. The melting heats of NbO<sub>2</sub> and NbO were determined to be 18 and 22 kcal/mole, respectively. The equation of free energy of the gaseous NbO<sub>2</sub> and NbO from the elements can be written as

$$\Delta F_{(NbO_2)}^{\circ} = -54300 - 4.5T; \quad \Delta F_{(NbO)}^{\circ} = 49500 - 23.4T$$

ACC NR: APO01903

The authors thank L. V. Gurevich and G. A. Khachkuruzova for the calculation of the thermodynamic potentials of condensed and gaseous  $\text{NbO}_2$  and  $\text{NbO}$ . Orig. art. has: 3 fig., 6 formulas, and 1 table.

SUB CODE: 07/ SUBM DATE: 30Jun64/ ORIG REF: 011/ OTH REF: 006

Card 3/3

G. A. SEMENOV and A. M. KHLAMOVA

"Development of the Technology for Manufacturing Materials with Low Dispersion in an Anomalous Glow Discharge" from Annotations of Works Completed in 1955 at the State Union Sci. Res. Inst; Min. of Radio Engineering Ind.

So: B-3,080,964

SEMENTOV, G.A.

Category: USSR/Fitting Out of Laboratories. Instruments, Their Theory, H.  
Construction and Use.

Abs Jour: Referat Zhur-Khimiya, No 9, 1957, 31167

Author : Semenov G. A.

Inst : Forestry Engineering Institute of the Volga Region

Title : Measurement of Temperature in a Variable Magnetic Field

Orig Pub: Sb. tr. Povolzhsk. lesotekhn. in-t, 1956, No 50, 127-136

Abstract: A theoretical and experimental demonstration of the possibility of utilizing thermocouples for the determination of temperature values of gases and solids in a variable magnetic field. To reduce the effect of a magnetic field, having a frequency of up to 1000 hertz, on the results of determinations, the thermocouples must be made of non-magnetic materials, the thermo-electrodes must be of bifilar splicing, each of them provided with efficient electric and thermal insulation over the entire length, and the leads of the thermocouples, within the inductor and over some length beyond it, must be disposed parallel to the inductor axis.

Card : 1/2

-22-

SEMENOV, G. A.

15  
3  
1-4520  
Joining ceramics to metal using a hard solder. E. A.  
Kolenko and G. A. Semenov. U.S.S.R. 106,624, July 25,  
1957. As flux is used an aq. suspension of  $MnO_2$ , and the  
soldering is done in an atm. of tech. H. M. Hosh

*SEMIENOV, G.A.*

USSR/Magnetism - Ferrites and Ferrimagnetism

F-4

Abs Jour : Ref Zhur - Fizika, No 1, 1958, 1175

Author : Semenov, G.A., Ozols, K.K.

Inst : "

Title : Properties and Methods for Obtaining a Ceramic Magnetically-Hard Material - Ferroxdure

Orig Pub : Tr. N.-i in-ta. M-vo radiotekhn. prom.-sti. SSSR, 1957, vyp. 5(41), 97-111

Abstract : Survey of the structure, properties technology of manufacture, and regions of application of ferroxdure,  $BaO \cdot 6Fe_2O_3$ , either isotropic or that obtained by pressing in a magnetic field.

Bibliography, 17 titles.

Card 1/1

SHCHUKAREV, S. A.; SEMENOV, G. A.

Evaporation of hafnium dioxide. Izv. vys. ucheb. zav.; khim.  
i khim. tekhn. 5 no.5:845 '62. (MIRA 16:1)

1. Leningradskiy gosudarstvennyy universitet imeni A. A.  
Zhdanova, kafedra neorganicheskoy khimii.

(Hafnium oxides) (Evaporation)



SEMENOV, G.F., inzhener.

Improving the sectional multiple-style process. Leg.prom.14 no.2:28-31  
(MLRA 7:5)

F 54.

(Clothing industry)

*REMEMBER, G.I.*

REZIN, M.G.; KROPACHEV, G.P.; BURDE, L.V.; SERGEYEV, S.V.; ~~SEMENOV, G.F.~~  
OSYKHOVSKIY, I.G.; DROBININ, Ya.I.; KOCHNEV, E.K.; MILAYKINA, R.N.  
PARAMONOVA, Ye.I.; LIKHACHEV, M.N. [deceased].

"Electric engineering." A.S. Kasatkin, M.A. Perekalin. Reviewed by M. G.  
Resin and others. Elektrichestvo no.7:94-95 J1 '57. (MIRA 10:8)  
(Electric engineering)  
(Kasatkin, A.S.) (Perekalin, M.A.)

BONDAREV, A.S.; SEMENOV, G.F.

Approximate calculation of the dispersion by a regular wave guide  
with dielectric. Izv. vys. ucheb. zav.; radiotekh. no.2:231-235  
Mr-Ap '58. (MIRA 11:5)

1. Rekomendovana kafedroy elektronnykh i ionnykh priborov Kiyevskogo  
ordena Lenina politekhnicheskogo instituta.  
(Wave guides)

СЕМЕНОВ, Г. П.

50V/142-58-A-29/30  
Stolyarov, A.G.  
All-Union Session Marking "Radio Day" (Vsesoyuznaya nauchnaya sessiya, posvyashchennaya "dnyu Radio")  
1958, No. 4, pp 517-521 (USSR)

During the period May 16-17, 1958, an All-Union Scientific Session "Radio Day" was held in Moscow, devoted to the work of the Scientific Technical Association for Radio-Engineering and Electro-Communications. 280 papers were read at the session, 25 in the field of electron theory and more than 50 in the field of electron optics, dealing with theoretical/experimental research results, dealing with the use of silicon in the construction of electronic equipment. L.I. Filippov and Multi-Ray Communication Capacity  
L.I. Filippov spoke on "The Transmission Capacity of a Multi-Ray Communication System".  
D.A. Novik spoke on "The Ideal Radio Receiver".  
D.A. Novik spoke on "The Transmission System of Electric Signals by the Optimal Coding of Shannon-Fano".  
A.Ye. Zubharinov and B.S. Pleyshman discussed "The Use of the Successive Analysis Method in Equipment for Determining Weak Signals in Noise" and "The Method for Determining Weak Signals in Noise".  
L.F. Borodin examined "The Potential Interference Resistance in a Tele-measuring System".  
V.A. Kishirin and G.A. Shuklova discussed "The Optimal Parameters of the Tele-measuring System with regard to Interference Resistance".  
B.S. Pleyshman spoke on the question of creating an optimal code - in the case of the connection of a binary symmetrical channel.  
L.F. Borodin discussed "The Method of Creating Several Codes with a Simple Base".  
In the field of electronics, P.A. Tarasov spoke on "Broad Band Electron Ray Tubes for Observation and Recording of Electric Impulses and Ultra-High Frequencies".  
L.F. Borodin examined the question of the practical application of tubes with a cathode net.  
G.P. Semenov, V.P. Gerasimov, M.M. Sbitneva and A.E. Bondarev examined "Use of Silicon in High-Frequency Rectifiers for Examining Electromagnetic Fields in resonators and wave guides".

Card 1/7

Card 2/7

SOV/120-59-2-34/50

AUTHORS: Semenov, G.F., and Bondarev, A.S.

TITLE: Four-pole and Two-pole Impedance Measurements by the Method of Switching Two Resistances (Izmereniye impedansov chetyrekhpolyusnikov i dvukhpolyusnikov metodom vklyucheniya dvukh soprotivleniy)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 2, pp 118-119 (USSR)

ABSTRACT: A simple method is proposed for the measurement of the input impedance of four-poles at audio frequencies; see circuit diagram shown in Fig 1. The source is connected to the four-pole via an L-section  $R_1$  and  $R_2$ . Shunt and series switches  $K_1$  and  $K_2$  respectively enable input voltage and current to be deduced from voltage readings and known resistances. With  $K_1$  closed and  $K_2$  open the input voltage to the four-pole is measured and the output voltage noted. With  $K_1$  open the new source voltage  $U_2$  for the same output is noted.  $K_2$  is then closed and  $U_3$  measured similarly. The Cartesian components of input impedance are given by Eqs (1) and (2). Since the voltages on the four-pole remain constant the method applies to active as

Card 1/2

SOV/120-59-2-34/50

Four-pole and Two-pole Impedance Measurements by the Method of  
Switching Two Resistances

Card  
2/2

well as passive circuits. In Ref 1 the input impedance  
of a cathode follower has been measured thus. By  
adding a third resistance as in Fig 2 the input  
impedance of two-poles may be measured. The instruments  
employed are: source 3G; indicator 28-I.  
There are 2 figures and 1 English reference.

ASSOCIATION: Kiyevskiy politekhnicheskii institut  
(Kiev Polytechnical Institute)

SUBMITTED: April 19, 1953

44346

S/142/62/005/006/009/011  
E192/E382

24.24.1  
AUTHORS: Bondarev, A.S. and Semenov, G.F.

TITLE: Approximate calculation of the electric field in a low-permittivity dielectric

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Radiotekhnika, v. 5, no. 6, 1962, 734 - 736

TEXT: An approximate expression for the relationship between the amplitude of the perturbation field in the volume of a dielectric and that of the non-perturbed field is derived.

If the dielectric is in the form of a thin plate which is parallel to the lines of the electric field  $E_0$ , it can be assumed that the amplitude of the field inside the dielectric will be approximately equal to that outside the dielectric. On the other hand, if the plate is positioned perpendicularly to  $E_0$ , the amplitude of the field in the dielectric is approximately reduced  $\epsilon/\epsilon_0$  times, where  $\epsilon_0$  is the permittivity of vacuum. In the general case, the vector of the electric field has a normal

Card 1/3

Approximate calculation ....

S/142/62/005/006/009/011  
E192/E382

component  $E_n$  and a tangential component  $E_\tau$ . The components of the field inside the dielectric are therefore  $\epsilon_0 E_n / \epsilon$  and  $E_\tau$ . The coefficient  $\delta$ , representing the ratio of the absolute value of the field in the dielectric to the absolute value of the field outside the dielectric on its boundary can be expressed as:

$$\delta \cdot \sqrt{E_n^2 + E_\tau^2} = \sqrt{\left(\frac{\epsilon_0}{\epsilon} E_n\right)^2 + E_\tau^2} \quad (1)$$

An average coefficient  $\delta$  for the electric field inside the dielectric is obtained by integrating Eq. (1) over the surface area  $S$  of the dielectric. This is expressed by:

$$\delta = \frac{\int_S \sqrt{\left(\frac{\epsilon_0}{\epsilon} E_n\right)^2 + E_\tau^2} ds}{\int_S \sqrt{E_n^2 + E_\tau^2} ds} \quad (3)$$

Card 2/3



Approximate calculation ....

S/142/62/005/006/009/011  
E192/E382

so that the amplitude of the field inside the dielectric is given by:  
(4) .

$$\vec{E} = \delta \vec{E}_0$$

The use of Eqs. (3) and (4) does not result in an error greater than 3% for the dielectric with relative permittivities of up to 1.4. However, the error becomes 27% in respect of permittivities of 2.6. There is 1 table.

ASSOCIATION:

Kafedra elektronnykh i ionnykh priborov Kiyevskogo  
ordena Lenina politekhnicheskogo instituta  
(Department of Electronic and Ionic Devices of  
Kiyev "Order of Lenin" Polytechnical Institute)

SUBMITTED:

March 16, 1962

L 56638-65 EWT(1)/EPA(s)-2/EEC(t)/EEC(b)-2/EWA(h) Pm-4/Pac-4/Pt-7/Peb/Pi-4/  
Pj-4/Pl-4 LJP(c) GG

ACCESSION NR: AP5011951

UR/0142/65/008/001/0055/0064  
621.373.413

AUTHOR: Semenov, G. F.

TITLE: Approximate method of calculating resonators containing dielectrics

SOURCE: IVUZ. Radiotekhnika, v. 8, no. 1, 1965, 55-64

TOPIC TAGS: resonator, waveguide resonator, dielectric containing resonator

ABSTRACT: The disturbed field of a dielectric-containing resonator is approximated by specially selected functions which depend on the size and dielectric constant of the dielectric. A dielectric-containing section of waveguide theoretically isolated by two conducting septa is regarded as a resonator. Formulas for rectangular, coaxial, and round resonators are derived; they are applicable to resonators with a dielectric of any size but with a regular shape. The author's approximate method is compared with an exact method and also with experimental results. A difference of only 1.5% is found between the resonant-

Card 1/2

L 56638-65

ACCESSION NR: AP5011951

frequency vs. dielectric-size curves obtained by the two methods for a rectangular waveguide with  $TE_{011}$  mode. The difference between the experimental results (in the 3-cm band) and the results obtained from the approximate method is only  $\pm 2\%$ . Orig. art. has: 6 figures and 43 formulas.

ASSOCIATION: none

SUBMITTED: 23Jan64

ENCL: 00

SUB CODE: EC

NO REF SOV: 008

OTHER: 001

434  
Card 2/2

L 31147-66 EWT(1)/EWA(h)

ACC NR: AP5014514

SOURCE CODE: UR/0141/65/008/002/0407/0409

AUTHOR: Semenov, G. F.

32  
8

ORG: Kiev Polytechnic Institute (Kiyevskiy politekhnicheskiy institut)

TITLE: Calculation of resonators and waveguides with multilayered dielectrics

SOURCE: IVUZ. Radiofizika, v. 8, no. 2, 1965, 407-409

TOPIC TAGS: resonator, waveguide, dielectric layer waveguide, circular waveguide, rectangular waveguide

ABSTRACT: Earlier studies (A. N. Ivanov, Izv. vyssh. uch. zav. - Radiotekhnika, 2, 48, 1959; A. I. Akhiezer, Ya. B. Faynberg, UFN, 44, 321, 1952; Zarubezhnaya tekhnika, 3, 2, 1959) have shown that the electrodynamic (field) method is applicable to the solution of general problems for resonators and waveguides with two- or three-layer dielectrics. The method can be simplified using boundary conditions for the field derivatives. As shown in another study (G. F. Semenov, Izv. vyssh. uch. zav. - Radiotekhnika, 6, 191, 1963), this would permit the consideration of one field component normal to the interface of the dielectric layers; if this component equals zero, the tangential component is considered. In this fashion, expressions may be derived suitable for calculating resonators and waveguides with any number of dielectric layers. For oscillations TM ( $E_z \neq 0$ ) in a rectangular resonator with a multi-

Card 1/4

UDC: 621.372.826.001.24

L 31147-66

ACC NR: AP501451

0

The abbreviation designates:

$$l_i = \lg(K_{ii} l_i), \quad K_i = K_{ii}$$

(where  $l_i$  is the thickness of the  $i$ -th dielectric layer). In solution of (1) consideration should be given to:

$$\omega^2 \epsilon_i \mu_i = K_{ii}^2 + K_y^2 + K_x^2. \quad (2)$$

where  $K_x = (\pi/b)m$  ( $m = 1, 2, 3, \dots$ ),  $K_y = (\pi/a)n$  ( $n = 1, 2, 3, \dots$ ),  $a$  and  $b$  are the dimensions of the resonator cross section.

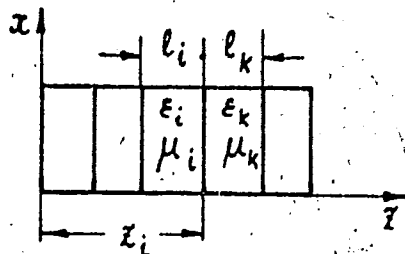


Fig. 1. Rectangular resonator with a multilayer dielectric

Card 3/4

L 31147-66

ACC NR: AP5014514

The author shows that Expression (1) may be used for circular and coaxial resonators with dielectric layers parallel to the resonator end walls and coaxial and circular resonators and waveguides with dielectric layers in the form of cylinders arranged symmetrically with respect to the axis. [LD]

SUB CODE: 20/ SUBM DATE: 30Sep63/ ORIG REF: 006

Card 4/4 *LC*

L 08331-67 EWT(1)

ACC NR: AR6033800

SOURCE CODE: UR/0058/66/000/007/H031/H031

24

AUTHOR: Semenov, G. F.

TITLE: Phase and amplitude correlations in resonators with a dielectric 75

SOURCE: Ref. zh. Fizika, Abs. 7Zh208

REF SOURCE: Vestn. Kiyevsk. politekhn. in-ta. Ser. radioelektron., no. 2, 1965, 29-35

TOPIC TAGS: resonator, dielectric layer

ABSTRACT: Phase and amplitude correlations are calculated in a rectangular resonator with a two-layer dielectric. This resonator makes it possible to make recommendations on the selection of a first approximation for the solution of the transcendent equation, when seeking resonance frequency. This in turn makes it possible to avoid errors in determining the root sought and reduces considerably the volume of computing work. The results obtained can be used, with some allowances, to calculate a rectangular resonator with several dielectric layers, and, likewise, for round and coaxial resonators, with dielectric layers situated parallel to the end walls of the resonator. Yu. Bogatyrev.

[Translation of abstract]

Card 1/1nst SUB CODE: 09/

RASKIN, V.I.; SEMENOV, G.I.

Determining causes for the breaking of counterbalance bolts of  
IAMZ engine crankshafts. Avt. prom. 29 no.11:14-15 N '63.  
(MIRA 16:12)

1. Yaroslavskiy motornyy zavod.



SECRET, S. I.

"The Conductivity of Solutions in a Strong Electric Field." Cand Chem  
Sci, Leningrad Technological Inst, Leningrad, 1954. (RZhKhim, No 6, Mar 55)

So: Sum. No 670, 29 Sept 55 - Survey of Scientific and Technical Dissertations  
Defended at USSR Higher Educational Institutions (15)

SEMENOV, G. I.

SEMENOV G. I.

5(4) PLAGIARISM EXPLOITATION 807/1A38

Boris, E.M., Ye. D. Volova, I.M. Yegorov, E.I. Nyst, K.P. Mikhchenko, A.M. Ponomarev, A.A. Bental', and G.I. Semenov

Prakticheskiye raboty po fizicheskoy khimii (Practical Work in Physical Chemistry) Leningrad, Goskhimizdat, 1971. 265 p. 11,000 copies printed.

Re: (Title page): K.P. Mikhchenko, Professor, and A.A. Bental', Docent; M. (Inside book): E.K. Lobina; Tech. Ed.: Ye. Ye. Zhilka.

PURPOSE: This textbook was approved by the Ministry of Higher Education as a manual for students of courses specializing in chemistry.

COVERAGE: The text covers the theoretical and practical aspects of experimental physical chemistry. It is the aim of the authors to aid the student in his laboratory work by preceding each experiment with a theoretical introduction, a description of the apparatus, and the order of the determination and computation of results. Much attention is given to the fundamentals of chemical thermodynamics, reaction kinetics, and equilibrium. The basic techniques of

Card 1/14

Practical Work in Physical Chemistry 807/1A38

experimentation and the treatment of experimental data are presented so as to enable the student to work independently. The text was prepared jointly by the staff of the Department of Physical Chemistry, Leningradskiy Tekhnicheskii Institut Imeni Leninsveta (Leningrad Technological Institute named after Lenin) and A.M. K.P. Mikhchenko (Leningrad Technological Institute named after Lenin) and A.A. Bental' (Leningrad Technological Institute named after Lenin). The book was reviewed by Professors Y.A. Kiryev, K.P. Mikhchenko, corresponding member of the AS USSR, and by the staff of Professor Nikol'skiy. There are no references.

TABLE OF CONTENTS:

|  |    |
|--|----|
| Preface  | 7  |
| INTRODUCTION   |    |
| Ch. I. Treatment of the Results of Measurements  | 9  |
| 1. Estimate of error in measurement  | 9  |
| Estimate of the accuracy of instrument readings  | 10 |
| Determination of the absolute and relative errors in the direct measurement of any given value | 11 |
| Selection of the necessary accuracy of measurement   | 11 |

Card 2/14

Semenov, G.I.

B-4

USSR/Physical Chemistry - Molecule, Chemical Bond.

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3571.

Author : A.A. Petrov, G.I. Semenov, N.P. Sopov.

Inst :

Title : Studies in Region of Conjugate Systems. LXXIII. Question of Order of Bromine Addition to Vinylacetylene.

Orig Pub: Zh. obshch. khimii, 1957, 27, No 4, 928-933.

Abstract: The infrared spectra of 1- and 2-bromobutadiene-1,3, 1,2-dibromobutadiene-1,3, 4-chlorobutadiene-1,2 and two main fractions of vinylacetylene dibromides were studied. It was shown that in case bromine acted on vinylacetylene, all the 3 possible dibromides were forming, the allene (I) and the 1,3-diene dibromides prevailing. This confirms the conclusions arrived at earlier basing on chemical data (Petrov A.A. and others, Zh. obshch. khimii, 1950, 20, 708). The content of I in the mixture rises at the expense of II at the bromination of vinylacetylene, if

-36-

Card : 1/2

SEMENOV, G. I.

PETROV, A.A.; PORFIR'YEVA, Yu.I.; SEMENOV, G.I.

Research in the field of conjugated systems. Part 74: Infrared spectra and reactivity of vinyl acetylene hydrocarbons. Zhur.ob. khim. 27 no-5:1167-1174 My '57. (MLRA 10:8)

1. Leningradskiy tekhnologicheskii institut imeni Lensovet. (Acetylene compounds--Spectra) (Vinyl compounds)

*SEMENOV, G.I.*

PETROV, A.A.; PORFIR'YEVA, Yu.I.; SEMENOV, G.I.

Research in the field of conjugated systems. Part 75: Reaction of propargyl bromide with aliphatic aldehydes in S.N. Reformatskii's conditional reactions. Zhur.ob.khim. 27 no.5:1175-1178 My '57.  
(MLRA 10:8)

1. Leningradskiy tekhnologicheskii institut imeni Lensoveta.  
(Propyne) (Aldehydes)

*SEMENOV, G. I.*

AUTHORS: Petrov, A. A. and Semenov, G. I. 79-11-7/56

TITLE: Investigations in the field of Combined Systems. LXXX.: Infrared Spectra of Some Acetylene- and Vinylacetylene-Alcohols (Issledovaniya v oblasti sopryazhennykh sistem. LXXX.: Infrakrasnyye spektry nekotorykh atsetilenuv/kh i viniilatsetilenuv/kh spirtov).

PERIODICAL: Zhurnal Obshchey Khimii, 1957, Vol. 27, No. 11, pp. 2941-2947 (USSR)

ABSTRACT: In one of the preceding publications it was shown that a parallelism exists in the infrared spectra between the reactivity of the double bond in the molecules of vinylacetylene hydrocarbons and their activity. [7] It was interesting, to compare these results with those referring to other classes of vinylacetylene compounds with short bonds. For this purpose the authors investigated the infrared spectra of two representatives of trivalent vinylacetylene alcohols for which the orderly course of the incorporation of bromine, hydrogen and alkylhypohalides was earlier described. As little is to be found in publications on the acetylene alcohols, the authors took the spectra of some mono-, bi- and trivalent acetylene alcohols being at their disposal. The spectrum of propargylalcohol can best be deciphered of all spectra obtained. Thus the infrared spectra of the 9 acetylene- and 2 vinylacetylene- alcohols were investigated and the

Card 1/2

Investigations in the Field of Combined Systems. IXXA.: Infrared Spectra of Some Acetylene- and Vinylacetylene-Alcohols. 79-11-7/56

fundamental rules governing these spectra are given on the basis of the usual information of the frequencies. The connection between the reactivity of the vinylacetylene alcohols and the intensity of the absorption bands of the spectra corresponding to the short bonds are is shown. There are 3 tables, and 7 references, 5 of which are Slavic.

ASSOCIATION: Leningrad Technological Institute imeni Lensovet (Leningradskiy tekhnologicheskiy institut imeni Lensoveta)

SUBMITTED: December 14, 1956

AVAILABLE: Library of Congress

1. Acetylene-Infrared spectra
2. Vinylacetylene-alcohols-Infrared spectra
3. Infrared spectra-Applications

Card 2/2

SEMEENOV, G. I.

AUTHORS: Petrov, A. A., Semenov, G. I. 79-11-8/56

TITLE: Investigations in the Field of Linked Systems (Issledovaniya v oblasti sopryazhennykh sistem). XXXI Infrared Spectra of Some  $\alpha, \beta$ -Unsaturated Acetylene-Aldehydes and Ketones (Infrakrasnyye spektry nekotorykh  $\alpha, \beta$ -nepredel'nykh atsetilenovykh al'degidov i ketonov).

PERIODICAL: Zhurnal Obshchey Khimii, 1957, Vol. 27, Nr 11, pp. 2947-2951 (USSR)

ABSTRACT: The investigation of the infrared spectra of the vinylacetylene hydrocarbons showed that the linkage of short bonds causes a displacement of the absorption bands toward the space of the long waves. At the same time some new rules governing the position and the intensity of these and other frequencies were observed which are due to the action of the radicals connected with this space upon the linked system. It was of interest to compare these spectra with those of the  $\alpha, \beta$ -unsaturated acetylene-aldehydes and ketones which also possess a double and triple binding in the state of linkage, in which, however, the double bond possesses a sharply expressed polarity. For this purpose the infrared spectra of the propargylaldehyde of butynone and of four ketones of the general formula  $R-C \equiv C-CO-CH_2$  were investigated. Thus the infrared spectra of propargylaldehyde, butynone, pentine-3-one-2,

Card 1/2



Investigations in the field of linked S, stems. ANI Infrared 79-11-8/56  
Spectra of Some  $\alpha, \beta$ -Unsaturated Acetylene-Aldehydes and-Ketones.

hexine-3-ons-2, heptine-3-ons-2 and octine-3-ons-2 were investigated. From this follows that the linked system  $C=C-C=O$  is analogous to the system  $C=C-C=C$ . The great influence exerted on the absorption, due to the triple bond, on the part of the carbonyl group in comparison with the double bond was recorded. There are 1 figure, 2 tables, and 12 references, 5 of which are Slavic.

ASSOCIATED WITH: Leningrad Technological Institute imeni Lensovet (Leningradskiy tekhnologicheskii institut imeni Lensoveta).

SUBMITTED: December 14, 1956

AVAILABLE: Library of Congress

1. Acetylene-Aldehydes-Infrared spectra
2. Acetylene-Ketones-Infrared spectra
3. Infrared spectra-Applications

Card 2/2

SEMENOV, G. I.

AUTHORS: Petrov, A. A., Semenov, G. I.

79-1-15/63

TITLE: Investigations in the Field of Combined Systems (Issledovaniya v oblasti sopryazhennykh sistem). LXXXII. Infrared Spectra of Vinylacetylene- and Diene-Ethers (LXXXII. Infrazrasnyye spektry viniilatsetilenovykh i diyenovykh efirov).

PERIODICAL: Zhurnal Obshchey Khimii. 1958. Vol. 28, Nr 1, pp. 71-75 (USSR).

ABSTRACT: In earlier papers the infrared spectra of some vinylacetylene hydrocarbons and alcohols (of the system of linkage  $C\equiv C-C=$   $=C$ ), as well as of acetylene aldehydes and ketones (of the linkage system  $C\equiv C-C=O$ ) were characterized. The authors continued the investigation regarding the connection existing between structure, physical properties and reactivity and examined the infrared spectra of some vinylacetylene- and diene-ethers with the general formulae:  $R-C\equiv C-COR=CH_2$  and  $R-CH=CH-COR=CH_2$ . Hitherto the infrared spectra had only been taken for some enole ethers. With regard to the ethers with short linkage systems no data had been published. The infrared spectra were taken with the aid of the device IKS - 2 (IKS - 2). The conditions under which they were taken are given in the preceding papers. The experimental data are

Card 1/2

Investigations in the Field of Combined Systems. LXXXII.  
Infrared Spectra of Vinylacetylene- and Diene-Ethers.

79-1-16/63

represented in the figure and in the table. The infrared spectra of the following compounds were investigated: The vinylacetylene (2-methoxybutene-1-in-3, 2-methoxypentens-1-in-3, 2-methoxyhexene-1-in-3, 2-methoxyheptene-1-in-3 and 2-methoxyoctene-1-in-3) and the 1,2-diene-ethers (2-ethoxybutadiene-1,3 and 2-ethoxypentadiene-1,3). Some regularities in the position and intensity of the absorption bands which correspond to the systems of short linkages were determined. There are 1 figure, 1 table, and 12 references, 8 of which are Slavic.

ASSOCIATION: Leningrad Technological Institute imeni Lensovet (Leningrad-  
skiy tekhnologicheskii institut imeni Lensoveta).

SUBMITTED: December 30, 1956

AVAILABLE: Library of Congress

Card 2/2

1. Alcohols
2. Vinyl acetate
3. Infrared spectrum-Analysis

SEMEV G I

AUTHORS: Petrov, A. A., Rall', K. B., Semenov, G. I. 79-2-32/64

TITLE: Investigations in the Field of Conjugated Systems  
(Issledovaniya v oblasti sopryazhennykh sistem). LXXXIII. The  
Structure and Reactivity of the Methyl Ether of Vinylacetylene  
Carboxylic Acid (LXXXIII. Stroyeniye i reaktsionnaya sposob-  
nost' metilovogo efira vinilatsetilenkarbonovoy kisloty).

PERIODICAL: Zhurnal Obshchey Khimii, 1958, Vol. 28, Nr 2, pp. 424-428 (USSR)

ABSTRACT: In the series of investigations of reactions at compounds with  
double and triple bindings the reaction of the above mentioned  
compound with bromine was investigated. The bromination takes  
place very slowly, is, however, accelerated at light (graphic-  
ally shown). Since the disintegrates dibromide obtained decays  
in vacuum distillation the structure of the compound obtained  
was investigated in the infrared spectrum. For this purpose al-  
so the infrared spectra of the initial compound and of some  
other ethers of similar structure were taken. The methyl ether  
was obtained according to the prescription of I. N. Nazarov  
and M. V. Kuvarzina, the others according to the usual methods.  
Data concluding the spectrometer and the bromination are given.  
The measurements obtained showed that the bromination takes  
place at the double bindings and the compound thus remains ar

Card 1/2

Investigations in the Field of Conjugated Systems 79-2-32/64  
LXXXVIII. The Structure and Reactivity of the Methyl Ether of Vinylacetylene  
Carboxylic Acid.

acetylene compound. Explanations of the various infrared spectra obtained and the connections between the different spectral bands and the structure of the compounds are given. There are 2 figures, 1 table, 10 references, 8 of which are Slavic.

ASSOCIATION: Technological Institute imeni Lensovet, Leningrad (Leningradskiy tekhnologicheskii institut imeni Lensoveta)

SUBMITTED: February 20, 1957

AVAILABLE: Library of Congress

Card 2/2

PETROV, A.A.; PORFIR'YEVA, Yu.I.; SEMENOV, G.I.

Conjugated systems. Part 43: Order of addition of alkyl hypobromites  
to vinyl alkyl acetylene. Zhur.ob.khim. 28 no.9:2325-2328 S '58.

(MIRA 11:11)

1. Leningradskiy tekhnologicheskij institut imeni Lensovetu.  
(Bromites) (Acetylene)

S/020/60/132/04/25/064  
B011/B003

5.3832

AUTHORS: Barvinok, M. S., Kuprin, V. S., Mazurek, V. V.,  
Semenov, G. I.

TITLE: Physicochemical Investigation of the Process Involved  
in the Formation of Furfurol-aniline Resins ✓

PERIODICAL: Doklady Akademii nauk SSSR, 1960, Vol. 132, No. 4,  
pp. 826-828

TEXT: The chemical nature of the formation of furfurol-aniline resins has not yet been described in publications. The authors investigated this problem by chemical and physical methods in addition to physico-chemical ones. They used aniline, furfurol, acetone, toluene (pro analysi), and hydrochloric acid (chemically pure). The light absorption of this system was measured with a photoelectric spectrophotometer of the type CΦ-4 (SF-4). Acetonic furfurol- and aniline solutions were mixed in different ratios. Concentrated hydrochloric acid was added to the aniline solutions in acetone. The light absorption of these

Card 1/4

Physicochemical Investigation of the  
Process Involved in the Formation of  
Furfurol-aniline Resins

S/020/60/132/04/25/064  
B011/B003

solutions was measured 30 min after mixing. The results are illustrated in Fig. 1. On the curve optical density/composition (Curve 1,  $\lambda = 560 \text{ m}\mu$ ) a special point is marked, which corresponds to the molar ratio of furfurool : aniline = 1 : 1 (spectral range 530-560  $\text{m}\mu$ ). The compound thus formed in the first stage of resin formation corresponds to furfuranil (I) (Ref. 4, see Scheme). The stage of a more intensive formation of resin was studied on the system furfurool - aniline - HCl - acetone (furfurool - aniline: 20 mole %, HCl 0.012 mole %). If furfurool-aniline mixtures are heated to 40°C and the HCl concentration is raised, the formation of resins is intensified. The diagram optical density/composition (Curve 2,  $\lambda = 565 \text{ m}\mu$ ) is more complicated in this case. On the curves optical density/composition special points are marked, which correspond to the molar ratios of furfurool: aniline = 2 : 1, 1 : 1, 1 : 2, and 1 : 4. These points are confirmed on this diagram by investigation of the cross section with a furfurool-aniline amount of 40 mole % (Curve 3,  $\lambda = 570 \text{ m}\mu$ ). The authors measured the viscosity of the system furfurool-aniline-HCl (HCl 0.012 mole %) with a viscosimeter

Card 2/4



Physicochemical Investigation of the  
Process Involved in the Formation of  
Furfurol-aniline Resins

S/020/60/132/04/25/064  
B011/B003

for precision measurements at 60°, since the furfurol-aniline resins were in viscous-liquid state at this temperature. On the curves viscosity/composition a distinct maximum is visible, which corresponds to the reaction of furfurol and aniline in a molar ratio of 1 : 2 (Curve 4). At this point the viscosity of the system exceeds the viscosity of the components used by 1000 times. The abscissa of this point (composition) does not change if a non-reacting substance is added (toluene), although the viscosity of the system is thus reduced. The thermal effect was investigated by means of a calorimeter. In order to construct the diagram thermal effect/composition, the system furfurol - aniline - HCl (HCl 0.048 mole %) was studied. The special point on Curve 5 corresponds to the reaction of furfurol with aniline in a molar ratio of 1 : 2. Thus, this special point on the diagrams composition/property is confirmed by studying light absorption, thermal effect, and viscosity. Resins corresponding to this special point are the best stabilizers for soils (Ref. 2). The authors proved by chemical methods and infrared spectroscopy that two chemical compounds correspond

Card 3/4

Physicochemical Investigation of the  
Process Involved in the Formation of  
Furfural-aniline Resins

S/020/60/132/04/25/064  
B011/B003

to the special point mentioned. One of these compounds (II) is converted into the other (III) by ring formation. (III) was obtained from the resin as colorless crystals with a melting point of 144°. On the strength of the results obtained the authors assume that furfural-aniline resins are a mixture of low-molecular compounds (II) and (III). Their crystallization is impeded by the non-cyclic form of (II). There are 1 figure and 6 references, 3 of which are Soviet.

PRESENTED: January 29, 1960, by I. V. Tananayev, Academician

SUBMITTED: January 20, 1960

Card 4/4

MISHCHENKO, K.P.; PONOMAREVA, A.M.; RAVDEL', A.A.; BARON, N.M.;  
YEGOROV, I.M.; KVIAT, E.I.; VOLOVA, Ye.D.; MARKOVICH, V.G.;  
SEMENOV, G.I.; MARGOLIS, V.N., SMORODINA, T.P.; YAVORSKIY,  
I.V. Prinsipal uchastiye FRANK-KAMENETSKIY, V.A.; TOMARCHENKO,  
S.L., red.; LEVIN, S.S., tekhn. red.

[Practical work in physical chemistry] Prakticheskie raboty po  
fizicheskoi khimii. Izd.2., perer. Leningrad, Gos. nauchno-  
tekh. izd-vo khim. lit-ry, 1961. 374 p. (MIRA 15:2)  
(Chemistry, Physical and theoretical--Laboratory manuals)

S/079/61/031/002/017/019  
B118/B208

AUTHORS: Barvinok, M. S., Kuprik, V. S., Mazurek, V. V., and Semenov,  
G. I.

TITLE: Study of the reaction of furfurole with aniline

PERIODICAL: Zhurnal obshchey khimii, v. 31, no. 2, 1961, 632-641

TEXT: To explain the chemism of resin formation, it was suitable for the investigation of the system "furfurole - aniline" to apply physicochemical analysis, in addition to chemical methods, to obtain a better insight into conversions occurring in this system. To follow up the formation of reaction products of furfurole with aniline in the first stage of reaction, the light absorption of the system "aniline - furfurole - hydrochloric acid - acetone" was studied. All chemically pure products applied had previously been distilled. An adequate quantity of hydrochloric acid was added to the aniline solution. Half an hour after mixing the acetone solutions of furfurole and aniline, the optical density attained a constant value. The curve of optical density as a function of composition shows a maximum in the range 350-566  $m\mu$  which corresponds to the formation of a chemical com-

✓

Card 1/3

Study of the reaction ...

S/079/61/031/C02/017/019  
B118/B208

pound from furfurole and aniline in a molar ratio of 1:1. To study the composition, the reaction products (at an advanced stage of resin formation of the mixture of different compositions), which were obtained by mixing furfurole with aniline and hydrochloric acid in the corresponding molar ratios, were thermostated at 40°C for 7 hr. The resinous material was dissolved in acetone, and the optical density of the solutions determined. Increase of temperature and hydrochloric acid content promotes resin formation. The curve of optical density as a function of composition now shows maxima corresponding to the molar furfurole/aniline ratios of 2:1, 1:1, 1:2, 1:4. The same mixtures of furfurole and aniline at elevated temperature lead to fixation of the resin formation at a certain stage. In order to confirm the complex formation, viscosity was studied as a function of composition, and thermal effect as a function of composition. Viscosity and thermal effect attained a maximum corresponding to the reaction of furfurole with aniline at a molar ratio of 1:2. A compound of this composition was separated from the resin in crystalline state; besides, its hydrogenation products were obtained. On the basis of the infrared and ultraviolet spectra of these compounds, and of the model compound (of 1, 5-diphenyl pyrrolidone-3), the structural formula 5-methyl aniline-1-phenyl pyrrolidone-3 was suggested

Card 2/3

Study of the reaction ...

S/079/61/031/002/017/019  
B118/B208

for the product separated from the resin. I. M. Motkina and B. N. Sverdlova assisted in the experiments. There are 8 figures, 2 tables, and 16 references: 1 Soviet-bloc and 10 non-Soviet-bloc.

SUBMITTED: July 18, 1960

Card 3/3

KAPLAN, G.Ye.; MOISEYEV, S.D.; GAVRILIN, V.M.; SEMENOV, G.I.; VOROTILIN,  
V.P.

Separation of thorium from rare earths by tributyl phosphate  
extraction. Ekstr.; teor.,prim.,app. no.2:154-159 '62.

(MIRA 15:9)

(Thorium) (Rare earths) (Butyl phosphate)

GAZANCHIYAN, V.I. [Hazanchian, V.I.], kand. ekonom. nauk; SEменов, G.I.  
[Semenov, H.I.]

Improving the planning and accounting of production costs in  
the clothing industry. V.I. Hazanchian, H.I. Semenov. Leh.  
prom. no.2872-76 At-Je'64 (MIRA 1967)



MAZUREK, V.V.; SEMENOV, G.I.;

Polarographic study of the Stenhouse aniline salt and its  
bases. Zhur. ob. khim. 34 no.11:3546-3549 N '64 (MIRA 18:1)

Kinetics and mechanism of Stenhouse aniline salt hydrolysis.  
Ibid.:3549-3554

SEMENOV, G.I. [Semenov, H.I.]

Aspects and analysis of the utilization of fabrics in the  
manufacture of clothing. Leh. prom. no.3:83-86 JI-S '65.  
(MIRA 18:9)

SEMENOV, G.I.

Efficiency of prospecting along stray fluxes in one of the  
regions of the northern Tien Shan. Zap. Kir. otd. Vses. min.  
ob-va no.5:71-77 '65. (MIR: 18:7)

SEMENOV, G.I.

Determining stresses in a crankshaft taking into consideration its deformations. Avt. prom. 31 no.8:13-16 Ag '65. (MIRA 12:8)

1. Yaroslavskiy motornyy zavod.

SKINDER, I.B., kand.tekhn.nauk; TOL'SKIY, V.Ye.; SEMENOV, G.I.

Investigating and developing the design of the suspension for  
the IAMZ-236 engine. Avt.prom. 27 no.11:7-10 N '61. (MIRA 14:10)

1. Nauchno-issledovatel'skiy avtomobil'nyy i avtomotornyy  
institut i Yaroslavskiy motornyy zavod.  
(Motortrucks--Engines)

WILKINSON, D.A.; KARSTENHOW, G.S.; SMITH, I.E.; SHANKS, G.R.

Studying the interaction of  $\text{Fe}_2\text{O}_3$  with iron oxides. Trudy  
MKHFI no.47:119-124 '64. (MIRA 13:8)

SEMENOV, G.M.; KUZNETSOV, D.A.; ZUBOVA, I.Ye.

Thermodynamic study of solid phase reactions in the system  
calcium oxide - iron oxides. Trudy MKHTI no.47:115-118 '64.  
(MIRA 18:9)

YERMILOV, N.A.; SEMENOV, G.M.

Improve planning of shop work. Zhel.dor.transp.38 no.12:69-71 D '56.  
(MLRA 10:2)

1. Sekretar' partiynogo komiteta parovoznogo depo Ulan-Udskoy Vostochno-Sibirskoy dorogi (for Yermilov). 2. Glavnyy bukhgalter depo Ulan-Udskoy Vostochno-Sibirskoy dorogi (for Semenov).  
(Locomotives--Repairs)



PODBORSKIY, L.Ye.; SAMOYLOV, O.P., inzhener; SEME NOV, G.M., inzhener.

Set of devices for transporting concrete mortar with the use of  
concrete pumps. Gidr.stroi. 25 no.3:22-25 Ap '56. (MIRA 9:9)  
(Concrete construction) (Pumping machinery)

*Semenov, G.M.*

AUTHORS: Podborskiy, L.Ye. and Semenov, G.M., Engineers 98-1-4/20  
TITLE: Mixers for Continuous Preparation of Cement Mortar (Smesteli dlya nepreryvnogo prigotovleniya tsementnogo testa)  
PERIODICAL: Gidrotekhnicheskoye Stroitel'stvo, 1958, # 1, pp 18-20 (USSR)

ABSTRACT: Methods as to the separate preparation of cement mixtures has been studied by various organizations during the past few years. By pre-treating cement mortar before adding fillers, the strength of cement can be increased by 25 to 30%.  
The first experiments along this line were conducted in 1953-1954 by Engineer V.V. Gerokhov at the construction of the Gor'kiy Hydro-electric Power Plant. To obtain cement mortar with a smaller water-cement ratio it was necessary to construct new type mixing machines.  
The Leningrad branch of VNIISTroydormash designed and manufactured two new types of mixers: the centrifugal-pin and the double worm mixer.

Card 1/2

The centrifugal-pin mixer is cylindrical, 1,800 mm in diameter, 180 mm high, and equipped with a star-shaped rotor. The double-worm mixer is 3.85 m long, trough-shaped, and

Mixers for Continuous Preparation of Cement Mortar

98-1-4/20

equipped with two worm conveyors.

Both mixers were found suitable for the preparation of cement mortar of a water-cement ratio of 0.3 and higher. The double-worm mixer is not as sensitive to changing consistencies of mixtures, has the advantage of lower power requirements and has a higher output than the centrifugal-pin mixer. Technological data of the double-worm mixer is given in a table.

There is 1 table, 1 figure, and 2 Russian references.

AVAILABLE: Library of Congress

Card 2/2

VLADIMIROV, M. F., Eng.; SEMENOV, G. N., Eng.

Bearings (Machinery)

Ways of saving metal in forging shops of bearing plants.  
Vest. mash., 32, No. 4, 1952.

Monthly List of Russian Accessions, Library of  
Congress, October 1952, UNCLASSIFIED.

SOV/137-58-7-14048

Translation from. Referativnyy zhurnal, Metallurgiya, 1958, Nr 7, p 9 (USSR

AUTHOR: Semenoy, G.P.

TITLE: Determination of the Relationship Between Amount of Sorted-out Rock and Improvement in the Quality of Iron Ores (Opredeleniye zavisimosti mezhdru kolichestvom otsortirovannoy porody i povysheniyem kachestva zheleznykh rud)

PERIODICAL: Tr. Sverdl. gorn. in-ta. 1957 Nr 29, pp 130-135

ABSTRACT: In hand sorting of certain Ural Mountain limonites, the largest amount of gangue (G) (10-30% of the total ore mass thus separated) is sorted directly in the space behind the area where the cutting or cleaning work of the unit is performed. Nomograms are presented permitting determination of the amount of G of given Fe content that has to be sorted out to raise the Fe % content of the ore to a state conditioned for further processes or, conversely, to determine the % to which the Fe contents of the ore mass have to be raised in sorting it. Thus, for example, in order to increase the Fe contents of commercial ore from 48 to 53% it is necessary to sort out 14% of the G, containing 13% Fe, and when 24% G containing 22% Fe is sorted out of the separated ore mass, the amount of Fe in the ore rises from 38 to 42%. A.M.

Card 1/1

1. Iron ores--Separation 2. Iron ores--Test results

SHAMPAROV, G.G., inzh.; SEMENOV, G.F., inzh.

Characteristics of rock displacement at Berezovskiy gold ore deposits. [Trudy]VTIMI no.50:121-129 '63.

(MIRA 17:10)

SEMENOV, G.P.

Saving metals is an additional potentiality for increasing the output of machinery. Mashinostroitel' no.12:6-7 D '60.  
(MIRA 13:12)

1. Glavnyy inzhener Elektrostal'skogo zavoda tyazhelogo mashinostroyeniya.

(Machinery industry)

СЕМЕРОВ, Г.С.

PHASE I BOOK EXTRACTIVES 507/560

Yedernye geofizicheskiye i obratnik staty po izopol'zovaniyu radioaktivnykh izotopov v tekhnicheskoy geologii i nefri (Nuclear Geophysics; Collection of Articles on the Use of Radioactive Radiation and Isotopes in Petroleum Geology) Moscow, Gosneftizdat, 1959. 370 p. Errata slip inserted. 4,000 copies printed.

Ed.: V.A. Alekseyev, Professor, Doctor of Geological and Mineralogical Sciences; Exec. Ed.: A.P. Kisilov; Tech. Ed.: A.S. Polosina.

PURPOSE: This book is intended for petroleum geologists, geophysicists and scientists engaged in geological research who are interested in radiometric techniques of petroleum prospecting.

CONTENTS: The collection contains 28 articles compiled by staff members and assistants of the Laboratory for Nuclear Geology and Geophysics of the Petroleum Institute (now the Institute for Geology and Mineral Fuel Processing) of the Academy of Sciences USSR, the Laboratory for Radiometric Logging of the All-Union Scientific Research Institute of Geophysics, and the heads of councils for planning research projects for petroleum enterprises. The articles treat new material on radiometric surveying in petroleum geology, describe radiometric instruments (counters, etc.) for registering neutrons and gamma rays, give the results of research with models of rock strata, introduce a fundamental method of rock analysis for effectively utilizing radioactivity in prospecting, analyze the study and interpretation of radiometric measurements in boreholes, and revise and interpret radiometric measurements in boreholes. Finally, a new method of surveying based on measuring the radioactivity of the surface of a prospective petroleum deposit is described. No personal files are mentioned. References accompany each article.

Grushov, A.P., V.V. Melnyev, G.S. Semenov, and A.D. Sobolov. Radiometric Logging of "Arctograf" and Its Use in Radiometric Oil and Gas Prospecting 279

Melnyev, V.V., and A.D. Sobolov. Scintillation Liquid Radiometer-Analyzer "Aviagra" for Aerial Prospecting 290

Stambukov, A.E. Experiment in the Separate Registration of the Thorium and Radium Components of Gamma Radiation from Prospecting With Automobile-Mounted Radiometers 300

Zhilipov, Ya.M. Some Problems in the Methodology and Theory of the Gamma-Counting Method 306

Zolotarev, A.Y. Effective Cross Sections of Chlorides for Slow Neutrons and Water-Bearing Strata, Based on Use of a Pulsating Neutron Source 332

Pospelov, D.F., and A.I. Zhuravskiy. A High Voltage Source of 100 KV for Neutron Counters Used in Cased Wells 337

Yerosolimskiy, B.G., L.M. Bondarenko, L.R. Vovrisik, Yu. S. Shchegolevich, and L.I. Yul'gin. A Beamless Neutron Tube 346

Vovrisik, L.R., and B.G. Yerosolimskiy. A Laboratory Neutron Generator 351

356

AVAILABLE: Library of Congress



SEMEŃOV, G. S.

BASE INDEX EXPLOITATION SOV/5410

...entskaya konferentsiya po mirnomu ispol'zovaniyu atomnoy  
energii, Tashkent, 1959.

... (Translations of the Tashkent Conference on the Peaceful  
Use of Atomic Energy) v. 2. Tashkent, Izd-vo AN UzSSR, 1960.  
449 p. Errata slip inserted. 1,500 copies printed.

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Candidate of Medical Sciences; D. Nishanov, Candidate of Chemical  
Sciences; A. S. Sadykov, Corresponding Member, Academy of Sciences  
USSR, Academician, Academy of Sciences Uzbek SSR; Yu. N. Talanin,

04411/20,

176

Transactions of the Tashkent (Cont.)

SOV/5410

Candidate of Physics and Mathematics; Ya. Kh. Turakulov, Doctor of Biological Sciences. Ed.: R. I. Khamidov; Tech. Ed.: A. G. Babakhanova.

PURPOSE : The publication is intended for scientific workers and specialists employed in enterprises where radioactive isotopes and nuclear radiation are used for research in chemical, geological, and technological fields.

COVERAGE: This collection of 133 articles represents the second volume of the Transactions of the Tashkent Conference on the Peaceful Uses of Atomic Energy. The individual articles deal with a wide range of problems in the field of nuclear radiation, including: production and chemical analysis of radioactive isotopes; investigation of the kinetics of chemical reactions by means of isotopes; application of spectral analysis for the manufacturing of radioactive preparations; radioactive methods for determining the content of elements in the rocks; and an analysis of methods for obtaining pure substances. Certain

Card 2/20

176

Transactions of the Tashkent (Cont.)

SOV/5410

Instruments used, such as automatic regulators, flowmeters, level gauges, and high-sensitivity gamma-relays, are described. No personalities are mentioned. References follow individual articles.

TABLE OF CONTENTS:

RADIOACTIVE ISOTOPES AND NUCLEAR RADIATION  
IN ENGINEERING AND GEOLOGY

Lobanov, Ye. M. [Institut yadernoy fiziki UzSSR - Institute of Nuclear Physics AS UzSSR]. Application of Radioactive Isotopes and Nuclear Radiation in Uzbekistan

7

Taksar, I. M., and V. A. Yanushkovskiy [Institut fiziki AN Latv SSR - Institute of Physics AS Latvian SSR]. Problems of the Typification of Automatic-Control Apparatus Based on the Use of Radioactive Isotopes

9

Card 3/20

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