SOV/156-58-2-4/48

AUTHORS: Galivenova, N. N., Shneyder, V. A.

TITLE: Concerning Some Physicochemical Properties of Barium-Selenate (O nekotorykh fiziko-khimicheskikh svoystvakh selenata bariya)

PERIODICAL: Nauchnyye doklady vysshoy shkoly, Khimiya i khimicheskaya tekhnologiya, 1958, Nr 2, pp. 216-220 (USSR)

ABSTRACT: Selenates of alkaline earth are more and more used in industry. However, the properties mentioned in the title, are almost unknown in pertinent publications (Refs 1-5). This statement is illustrated by some examples (Refs 6-9). The authors determined the solubility of barium selenate polarographically in water of temperatures ranging from 15-95° and studied the properties of crystalline salt in the course of its heat treatment. The values of solubility are shown in table 1. The composition and crystalline structure of the bottom phase undergoes no modification between 15 and 100° and is formed at a stir-up of the mentioned salt in water. The thermal decomposition process sets in at about 850°. It proceeds in solid state with the absorption of heat. Barium selenate does not melt; its by-product barium selenite, however, does. The melting temperature of the latter amounts to about 1285°. The thermal decompo-

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Concerning Some Physicochemical Properties of Barium-Selenate

Initial product of barium selenate proceeds according to the following equation:

$BaSeO_4 \longrightarrow BaSeO_3 + 1/2\ O_2$ and $BaSeO_3 \longrightarrow BaO + SeO_2$

Professor L. V. Pustinskiy participated in the critical discussion of this project. There are 7 figures, 3 tables, and 13 references, 4 of which are Soviet.

ASSOCIATION: Kafedra neorganicheskoy khimii Moskovskogo khimiko-tekhnologicheskogo instituta im. D. I. Mendeleyeva
(Chair of Inorganic Chemistry of the Chemical and Technical Institute imeni D. I. Mendeleyev, Moscow)

SUBMITTED: September 21, 1957

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SOV/133-58-3-5/30

5(4), 5(2)
AUTHORS: Selivanova, N. M., Zubova, G. A.

TITLE: Physical and Chemical Properties of Strontium Selenate (Fiziko-khimicheskiye svoystva selenata strontsiya)

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 3, pp 27 - 33 (USSR)

ABSTRACT: The industrial use of the selenates besides other selenium compounds is steadily increasing (Refs 1-6). The knowledge of the properties mentioned in the title, which are little known, is becoming urgent more and more (Refs 7-12). The strontium selenate belongs to the least known salts of the selenic acid, and there are only a few data available on its solubility (Ref 13). Its behavior on heating (Ref 14) is hardly known. The clarification of these questions is the purpose of the present paper. The determination results of the solubility of strontium selenate in the thermostat at 25± 0.1° by the polarographic and gravimetric method are seen in table 1. The solubility

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product Lp (as average number of both methods) was $3.75.10^{-4}$. The solubility of the strontium selenate (determined by these two methods) between 0 and 100° in the thermostat is given in table 2 (polythermal lines of the solubility). By heating the strontium selenate (in contrast with $SrSO_4$) does not undergo a polymorphous enantiotropic transformation. On heating it is decomposed under selenite formation and oxygen separation. Thus, the chemism of the selenate decomposition differs from that of the strontium sulfate. Professor N.F.Kapustinskiy, Corresponding Member, Academy of Sciences, USSR, has critically reviewed this paper. There are 4 figures, 4 tables, and 31 references, 9 of which are Soviet.

Physical and Chemical Properties of Strontium Selenate SOV/153-58-3-5/30

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I.Mendeleyeva (Moscow Institute of Chemical Technology imeni D.I. Mendeleyev) Kafedra obshchey i neorganicheskoy khimii (Chair of General and Inorganic Chemistry)

SUBMITTED: October 2, 1957

Card 3/3

AUTHORS: Selivanova, N. M., Shneyder, V. A. SOV/156-58-4-13/49

TITLE: On Some Physico-Chemical Properties of Calcium Selenate (O nekotorykh fiziko-khimicheskikh svoystvakh selenata kal'tsiya)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Khimiya i khimicheskaya tekhnologiya, 1958, Nr 4, pp 664-666 (USSR)

ABSTRACT: The solubility of $CaSeO_4 \cdot 2H_2O$ in water within the temperature range of from (-2.6°) to (+101.8°) was investigated, and the behavior of this salt on heating was determined. The chemical analyses and the microscopic and radioscopic investigations have shown that in the temperature range to be investigated only the compound $CaSeO_4 \cdot 2H_2O$ is present. The heating and cooling curve of calcium selenate for temperatures of from 50° to 1000°C were plotted. The heating curve of calcium selenate is up to 600° similar to the heating curve of gypsum. At 140°C the weight loss amounts to 13,46%, at 200°C to 16.40%. On the heating curve an endothermal effect occurs at 698°C, which indicates the decomposition of $CaSeO_4$. The decomposition

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On Some Physico-Chemical Properties of Calcium Selenate

leads to the formation of selenite ($CaSeO_3$) and is finished at 800°C. The radiograms of the decomposition salts taken prove the presence of calcium selenite. The melting point of calcium selenite is at 920°C. The comparison of the melting temperature with the decomposition temperature of the selenates and sulfates of calcium shows that calcium selenate is thermally less stable than calcium sulfate. There are 3 figures, 1 table, and 8 references, 6 of which are Soviet.

ASSOCIATION: Kafedra obshchey i neorganicheskoy khimii Moskovskogo khimiko-tekhnologicheskogo instituta im. D. I. Mendeleyeva (Chair of General and Inorganic Chemistry at the Moscow Chemo-Technological Institute imeni D. I. Mendeleyev)

SUBMITTED: May 9, 1958

AUTHORS: Selivanova, N.M., Shneyder, V.A. SOV/63-3-6-37/43

TITLE: The Thermodynamic Properties of Selenate Plaster ($CaSeO_4 \cdot 2H_2O$) (O termodinamicheskikh svoystvakh selenato-gipsa) ($CaSeO_4 \cdot 2H_2O$)

PERIODICAL: Khimicheskaya nauka i promyshlennost', 1958, Vol III, Nr 6, pp 834-835 (USSR)

ABSTRACT: The formation heat of selenate plaster has been determined as 9.263 kcal/mole, the change of the free energy as -335.18 kcal/mole, the absolute entropy as 36.08 entropic units. There are 3 references, 2 of which are Soviet and 1 American.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva (Moscow Chemical-Technological Institute imeni D.I. Mendeleyev)

SUBMITTED: May 14, 1958

Card 1/1

78-3-6-4/30

AUTHORS: Selivanova, N. M., Shneyder, V. A., Zubova, G. A.

TITLE: On the Thermal Decomposition of the Selenates of Strontium, Barium and Lead (O termicheskom razlozhenii selenatov strontsiya, bariya i svintsa)

PERIODICAL: Zhurnal Neorganicheskoy Khimii, 1958, Vol. 3, Nr 6, pp. 1295 - 1303 (USSR)

ABSTRACT: The thermograms and the cooling curves of the selenates of strontium, barium and lead were investigated in order to explain the effects occurring in these curves.The thermographic analyses of strontium and barium selenate were performed within temperature ranges of from 100-1300°C. On this occasion three effects take place: For strontium selenate: at 525°C(exothermic), at 835°C(endothermic), and at 115°C (endothermic).For barium selenate: at 630°C(exothermic), at 900°C(endothermic), and at 1285°C(endothermic). The cooling curves of strontium and barium selenate do not agree with the heating curves of the two compounds, i. e. both processes are

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On the Thermal Decomposition of the Selenates of Strontium, Barium and Lead

not reversible. It can be seen from the thermograms that also selenium is oxidized by Se^{4+} in Se^{6+}. It was shown that the selenates of strontium, barium and lead when heated, pass into selenite under the release of oxygen. The chemical analyses of the final products in the thermal analyses were confirmed by x-ray analysis. The thermographic analysis of lead selenate showed that at 680°C and 930°C thermal effects take place and that beginning with 930°C this compound melts. At 1000°C the lead selenite formed at 700°C passes into lead oxide. It was found that strontium, barium and lead selenate are thermally more unstable than the corresponding sulfates. There are 7 figures, 6 tables and 33 references, 9 of which are Soviet.

SUBMITTED: May 6, 1957

AVAILABLE: Library of Congress

Card 2/2 1. Strontium selenates--Thermal analysis 2. Lead selenates--Thermal analysis 3. Barium selenates--Thermal analysis

SOV/76-32-6-14/46

AUTHOR: Selivanova, N.M.

TITLE: Some Thermodynamic Properties of Thallium Selenate (O nekotorykh termodinamicheskikh svoystvakh selenata talliya)

PERIODICAL: Zhurnal fizicheskoy khimii, 1958, Vol. 32, Nr 6, pp 1277-1279 (USSR)

ABSTRACT: The heat of solution, and the difference in the free energy in the formation of this salt from aqueous ions under standard conditions was computed. In this connection, data from publications concerning the solubility of thallium selenate in water at temperatures from 0° to 100°C were used. The activation coefficient of saturated solutions of thallium selenate γ was obtained by interpolation of the values for salts of the type Me_2SO_4 from the monograph by Kharned and Owen (Ref 7). The interpolation was made graphically. The results for the activity at from 10° to 40° and the heat of solution was given at intervals of 5 or 10° in a table. They agree with those proposed by Latimer (Ref 10) for such ions. The difference in the free energy and the heats of formation

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Some Thermodynamic Properties of Thallium Selenate SOV/76-32-6-14/46

of crystalline Tl_2SeO_4 are also given. Finally thanks are expressed to Professor A. F. Kaputsinskiy for a critical review of the paper. There are 1 table and 10 references, 3 of which are Soviet.

ASSOCIATION: Khimiko-tekhnologicheskiy institut im. D.I. Mendeleyeva, Moskva (Moscow Chemical and Technological Institute imeni D. I. Mendeleyev)

SUBMITTED: January 21, 1957

1. Thallium selenates--Thermodynamic properties 2. Thallium selenates--Heat of formation 3. Thallium selenates--Heat of solution 4. Mathematics

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5(2)

AUTHORS: Selivanova, N. M., Kapustinskiy, A. F., SOV/62-59-2-2/4
Zubova, G. A.

TITLE: Thermochemical Properties of Difficultly Soluble Selenates and Entropy of the Selenate Ion in Aqueous Solution (Termokhimicheskiye svoystva trudnorastvorimykh selenatov i entropiya selenat-iona v vodnom rastvore)

PERIODICAL: Izvestiya Akademii nauk SSSR. Otdeleniye khimicheskikh nauk, 1959, Nr 2, pp 187-194 (USSR)

ABSTRACT: In the present paper the authors determined the reaction heat in the precipitation of lead and barium selenates from aqueous solutions by means of selenic acid with $< C.3\% H_2SeO_3$-content. From the data obtained the formation heat of $PbSeO_4$ and $BaSeO_4$ from elements, their absolute entropies and the entropy of the aqueous selenate ion under standard conditions were calculated. For $PbSeO_4$ the heat of solution was computed according to the solubility data of this salt in water at different temperatures. For this purpose the solubility of $PbSeO_4$ in water was investigated in the temperature range of

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from 0 to 100°. From the measurements carried out for the reaction $Ba_{solid} + Se_{solid} + 2O_2 = BaSeO_4$

ΔH_{298} = -279.2 large calorie/mole and ΔF_{298} = -249.1 large calorie/mole,

for the reaction $Pb_{solid} + Se_{solid} + 2O_2 = PbSeO_4$

ΔH_{298} = -148.7 large calorie/mole and ΔF_{298} = -120.5 large calorie/mole

were obtained. According to thermodynamic data for H_2SeO_4, $SrSeO_4$, $BaSeO_4$, $PbSeO_4$ and Tl_2SeO_4 the mean value of entropy of the aqueous SeO_4^{2-} ion is

$$S = 5.5 \pm 0.3 \text{ entropy units.}$$

The authors express their gratitude to the student Ye. I. Finkel'shteyn for his taking part in the experimental part of the work. There are 1 figure, 6 tables, and 16 references, 8 of which are Soviet.

Thermochemical Properties of Difficultly Soluble Selenates and Entropy of the Selenate Ion in Aqueous Solution

SOV/62-59-2-2/4C

ASSOCIATION: Khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva (Institute for Chemical Technology imeni D. I. Mendeleyev)

SUBMITTED: July 5, 1957

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SOV/153-2-4-1/32

5(1,4)

AUTHORS: Selivanova, N. M., Shneyder, V. A.

TITLE: Physico-chemical Properties of Selenates. V. Formation Heat of Calcium Selenate From Elements

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1959, Vol 2, Nr 4, pp 475 - 479 (USSR)

ABSTRACT: The salt mentioned in the subtitle is very close to calcium sulfate on account of its properties. Although the heat effects of many reactions with the latter participating were described (Refs 1-5), investigations with regard to calcium selenate are missing. The paper under review aims at determining the formation heats of the crystalline salts $CaSeO_4 \cdot 2H_2O$ and $CaSeO_4$.

Table 1 shows the determination results of the heat of the interacting reaction of the former salt with an aqueous silver nitrate solution. An average value of 9.26 ± 0.240 kcal/mol is assumed by the authors. The precipitate of silver selenate formed in the calorimeter was chemically analyzed. The results are in perfect agreement with data on a salt synthesized earlier. The same is true of the interplanar spacings computed on account of the

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Debye-Sherrer radiograph (Table 2). The formation heat of crystalline calcium sulfate (Ref 14) is shown in comparison, and the difference between the formation heats of the latter and the selenate (=70.29 kcal/mol) is determined. Table 3 shows the dissociation heats of the two selenates under discussion at 25°. A. A. Mayer determined the refractive indices. The hydration heat of $CaSeO_4$ ($Q_{hydration}$) was -6.02 ± 0.10 kcal/mol as compared to the hydration heat of -6.990 kcal/mol of soluble anhydrite up to $CaSO_4.2H_2O$ (Ref 18). The combination of the former value with the evaporation heat of water (+10.51 kcal/mol, Ref 14) gives the dissociation heat of selenate-plaster, i.e. 27.04 kcal. The value of the heat effect of an analogous process with sulfates determined by means of a differential-thermal analysis varies between 27.24 and 29.24 kcal/mol (Ref 18). The authors compute the formation heat of crystalline $CaSeO_4.2H_2O$ from elements using the value of the hydration heat of $CaSeO_4$ (-6.02 kcal/mol) as well as the previously found value of crystalline $CaSeO_4$ from elements, and assuming that the formation heat of water is -68.32 kcal/mol

(Ref 14): $\Delta H^{o}_{298.16}$ = - 270.11±0.40 kcal/mol. The difference between the formation heats of $CaSO_4$ and $CaSeO_4$ is 70.16 kcal/mol. The energy of the lattice (U) of the low-temperature modification of $CaSeSO_4$ could be computed according to the known equation on account of the results obtained. Thus U of the $CaSeO_4$ modification mentioned last is -609.7 kcal/mol as determined by the authors. Similarly, the value of -646.8 kcal/mol for soluble anhydrite is found. A. F. Kapustinskiy, Corresponding Member AS USSR, contributed to the paper by expressing his criticism. In addition, M. S. Stakhanova is mentioned in the paper. There are 3 tables and 20 references, 8 of which are Soviet.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni D. I. Mendeleyeva, Kafedra obshchey i neorganicheskoy khimii (Moscow Institute of Chemical Technology imeni D. I. Mendeleyev, Chair of General and Inorganic Chemistry)

SUBMITTED: May 12, 1958

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5 (4)

67031
SOV/153-2-5-1/31

AUTHORS: Seliyanova, N. M., Shneyder, V. A.

TITLE: Physico-chemical Properties of the Selenates. VI. Solubility of Calcium Selenate in Water at Different Temperatures

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Khimiya i khimicheskaya tekhnologiya, 1959, Vol 2, Nr 5, pp 651-656 (USSR)

ABSTRACT: The authors studied the solubility of calcium selenate starting from the cryohydrate point to the boiling point of the saturated solution. The results are given in table 1. The chemical analysis as well as the microscopic and roentgen examination showed that the composition of the ground phase, i.e. $CaSeO_4 \cdot 2H_2O$ is constant between 0 and 101.8°C. The calcium content in this phase (obtained at 101.8°) is 18.21%, the selenium content is 35.88%. The refractive indices are: $N_g = 1.576$, $N_p = 1.563$, $d_4^{20} = 2.68$, which were determined by A. A. Mayer. Table 2 proves that the interplanar spacings, calculated from the roentgenogram according to Debye-Scherrer, are in accordance with the values of the previously synthesized crystalline $CaSeO_4 \cdot 2H_2O$ and with the interplanar spacings of

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the ground phase obtained by mixing the $CaSeO_4 \cdot 2H_2O$ in water at 0°C. Table 1 shows that the solubility of the calcium selenate constantly decreases with increasing temperatures. By comparison with the solubility of gypsum (Ref 6) the higher degree of solubility of the selenate, as compared to the sulfates (Ref 7), is again confirmed. The authors have previously established (Refs 8, 9) that the temperature coefficients of the solubility of $SrSeO_4$ and $SrSO_4$ on one hand, and that of $BaSeO_4$ and $BaSO_4$ on the other, have opposite signs, that of the selenates being negative. Therefore the law of S. S. Chin (Ref 10) did not prove true for the selenates and sulfates of calcium, strontium and barium. The authors did not succeed in determining the solubility of anhydrous calcium selenate in water. The data obtained by the authors on the solubility of $CaSeO_4 \cdot 2H_2O$ was used for the calculation of the solution-temperature in water, which is 1.820 kcal/mol. From this it was possible to calculate the value of the integral solution-temperature according to the

Physico-chemical Properties of the Selenates. VI. Solubility of Calcium Selenate in Water at Different Temperatures

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following formula, with the preparation of a saturated solution at 25°C (Q_{satur}): $H = C_{satur} \frac{Q_{satur} - Q_{unsatur}}{C_{satur} - C_{unsatur}} + Q_{satur}$, in which $Q_{unsatur}$ - 2.031 kcal and C is a concentration of 1 mol of saturated solution in 100/C mol of the solution agent. For additional calculations they used the thermodynamic data for calcium ions, for selenate ions and for water (Ref 21). The data concerning the $CaSeO_4 \cdot 2H_2O$ make possible the calculation of the entropy. From its change in the reaction (1) and, with consideration of the entropy-values of selenium, oxygen, hydrogen and metallic calcium (Refs 21, 22), the absolute entropy of crystalline $CaSeO_4 \cdot 2H_2O$ is calculated. Professor A. F. Kapustinskiy, Corresponding Member of the AS USSR, is mentioned in the article. The calcium selenate was prepared in the "Krasnyy Khimik" ("Red Chemist") Works. There are 3 tables and 23 references, 12 of which are Soviet.

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67031

Physico-chemical Properties of the Selenates. VI. Solubility of Calcium Selenate in Water at Different Temperatures

SOV/153-2-5-1/31

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut imeni D. I. Mendeleyeva; Kafedra obshchey i neorganicheskoy khimii (Moscow Chemical-technological Institute imeni D. I. Mendeleyev, Chair of General and Inorganic Chemistry)

SUBMITTED: May 12, 1958

4

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5(2) SOV/78-4-7-3/44

AUTHORS: Selivanova, N. M., Shneyder, V. A., Strel'tsov, I. S.

TITLE: The Thermal Decomposition of Calcium Selenate (Termicheskoye razlozheniye selenata kal'tsiya)

PERIODICAL: Zhurnal neorganicheskoy khimii, 1959, Vol 4, Nr 7, pp 1481-1487 (USSR)

ABSTRACT: The heating- and cooling-curves of calcium selenate (Fig 1) were plotted by means of the N. S. Kurnakov-pyrometer. The temperature at the beginning of decomposition and at complete decomposition, the melting temperature, and the degree of thermal decomposition between 200-1150° were determined. The salt $CaSeO_4 \cdot 2H_2O$ served as a starting basis. The heating curve up to 600° develops in a manner similar to that in the case of gypsum. The cooling curve is not in agreement with the heating curve, because irreversible processes occur in the case of heating. The data of the analysis of the salt annealed at different temperatures are given by table 1. Table 2 mentions the losses in weight at various temperatures. A microscopical investigation of the salt heated up to 200° shows a mixture of

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The Thermal Decomposition of Calcium Selenate

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$CaSeO_4 \cdot 2H_2O$-crystals and fine needle-shaped crystals of the non-aqueous selenate. Attempts made to produce the semihydrate $CaSeO_4 \cdot \frac{1}{2} H_2O$ were unsuccessful. During heating, modification changes sometimes occur. At 698° decomposition and conversion into selenite begins: $2CaSeO_4 \longrightarrow 2CaSeO_3 + O_2$ with partial volatilization. The final product is calcium oxide and anhydride of the selenic acid. The results obtained do not explain the reversible endothermal effect at 786° of the heating curve. The results of the Debye-Scherrer X-ray pictures are given by table 3. As shown by table 4, calcium selenate is less temperature-resistant than calcium sulfate. The refraction indices of the crystals were determined by A. I. Mayer. There are 1 figure, 4 tables, and 23 references, 10 of which are Soviet.

SUBMITTED: April 11, 1958

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5(4), 24(6) SOV/76-33-1-23/45

AUTHORS: Selivanova, N. M., Zubova, G. A.

TITLE: Thermodynamic Properties of Strontium Selenate (Termodinamicheskiye svoystva selenata strontsiya)

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 1, pp 141 - 146 (USSR)

ABSTRACT: The thermodynamic properties of strontium selenate have so far not been investigated. In analogy to $SrSO_4$, $SrSeO_4$ should be little soluble in water and thus the thermodynamic constants can be determined from the solubility and the precipitation heat. The solubility of $SrSeO_4$ in water at 25° was determined and calorimetric determinations of the precipitation heat from an aqueous solution under standard conditions were carried out. The experimental data obtained were elaborated thermodynamically. $SrSeO_4$ was produced from re-crystallized $Sr(NO_3)_2$ and selenic acid (Ref 2). A. I. Mayyer determined the refraction index. The value of the solubility product of $SrSeO_4$ in water at 25°C obtained

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by polarographic and gravimetric determinations is $3.75.10^{-4}$. The change of free energy on precipitation is $Sr^{2+}+SeO_4^{2-} = SrSeO_4$ - 6090 cal. The precipitation heat of $SrSeO_4$ is -140 cal. Under standard conditions the free formation energy from the elements is -244.7 kcal/mol and the formation heat -275.37 kcal/mol. The precipitation heat was determined from an aqueous potassium selenate solution and crystalline $SrCl_2.6H_2O$ in connection with a heat radiation correction carried out according to the Renault-Pfaundler-Usov (Ren'o) equation. A precipitate was obtained in the form of long transparent needles and was verified as $SrSeO_4$. The absolute entropy of $SrSeO_4$ is S_{298} = 18.12 entropy units. The entropy of the selenate ion in water is SeO^2_{4aq} : S_{298} = 5.48 entropy units. In conclusion the authors thank A. F. Kapustinskiy. There are 1 figure, 4 tables, and 14 references, 7 of which are Soviet.

Thermodynamic Properties of Strontium Selenate SOV/76-33-1-23/45

ASSOCIATION: Khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva, Moskva (Chemical-Technological Institute imeni D. I. Mendeleyev, Moscow)

SUBMITTED: July 1, 1957

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05841

5(4) SOV/76-33-10-39/45

AUTHORS: Selivanova, N. M., Zubova, G. A., Finkel'shteyn, Ye. I.

TITLE: Thermodynamic Properties of Silver Selenate

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 10, pp 2365 - 2369 (USSR)

ABSTRACT: Thermodynamic investigations of silver selenate, including those by Metzner (Ref 1), Meyer and Hinke (Ref 5) as well as Gelbach and King (Ref 6) have not yet yielded compatible results. These investigations were therefore checked in this article with the application of two different methods, namely determination of the solubility of Ag_2SeO_4 in water at 25° and calorimetric determination of the heat of precipitation of Ag_2SeO_4 from aqueous solutions under standard conditions with subsequent thermodynamic interpretation of the resultant experimental data. The solubility of Ag_2SeO_4 (Table 1) which was turbidimetrically determined, is closer to the data of reference 6 than to those of reference 5. It amounts to $1.26.10^{-3}$ mol/l. The heat of formation of Ag_2SeO_4 cryst

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Thermodynamic Properties of Silver Selenate

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was determined by means of an isothermal calorimeter (described in reference 4) produced from silver nitrate solution and selenic acid solution (Table 2: heat of dilution of a 7.07m H_2SeO_4 solution). Radiation losses were corrected according to the Regnault-Pfaundler-Usov formula. The values obtained for the heats of precipitation (heats of formation in aqueous solutions) of Ag_2SeO_4 are listed in table 4, data of the radiographs of the resultant precipitates are given in table 3. The values $\Delta H^o_{298.16}$=-105.05 kcal/mol and $\Delta F^o_{298.16}$=-8078 kcal/mol are given for the reaction $2\,Ag_{cryst}+Se_{cryst}+2O_{2\ gas}=Ag_2SeO_{4\ cryst}$ as well as the calculated entropy of the ion $SeO_{4\ aq.}$: $S^o_{298.16}$=5.50 units of entropy. In conclusion, the authors thank A. F. Kapustinskiy, Correpsonding Member of the AS USSR for his critique. There are 4 tables and 9 references, 5 of which are Soviet.

ASSOCIATION: Khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva, Moskva (Institute of Chemical Technology imeni D. I. Mendeleyev, Moscow)

SUBMITTED: May 4, 1958

Card 2/2

SELIVANOVA, N.M.; SHREYDER, V.A.; STREL'TSOV, I.S.

Physicochemical study of selenates. Part 9: Thermal decomposition of magnesium selenate. Izv. vys. ucheb. zav; khim. i khim. tekh. 3 no. 5:787-793 '60.
(MIRA 13:12)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I.Mendeleyeva. Kafedra obshchey i neorganicheskoy khimii.
(Magnesium selenate)

S/063/60/005/003/009/011/XX
A051/A029

AUTHORS: Selivanova, N.M., Shneyder, V.A.

TITLE: On the Thermal Decomposition of Magnesium Selenate

PERIODICAL: Zhurnal Vsesoyuznogo Khimicheskogo Obshchestva im. D.I. Mendeleyeva, 1960, Vol. 5, No. 3, pp. 353-354

TEXT: A study was made on $MgSeO_4 \cdot 6H_2O$ usually stable under normal conditions. According to the experimental analysis, the content of magnesium and selenium in the initial salt was 8.59 and 28.78%, compared to the theoretical values of 8.83 and 28.68%; $d_4^{20} = 2.01$; $N_g = 1.495$; $N_p = 1.464$. The behavior of this salt at high temperatures was investigated by recording heating and cooling curves with a Kurnakov pyrometer. The experimental procedure was as follows: the salt was placed in a corundum crucible, which was inserted into a ceramic block. The heating rate of the furnace was 8-10°C per min. Magnesium oxide was used as the inert substance. The thermocouple was platinum-platino-rhodium. Fig.1 is the curve of the heated product. The cooling

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S/063/60/005/003/009/011/XX
A051/A029

On the Thermal Decomposition of Magnesium Selenate

curve of the magnesium selenate does not correspond to its heating curve, i.e., the processes which take place during heating of this salt under experimental conditions are non-reversible. Fig 2. is the curve of the anhydrous magnesium selenate plotted under the same conditions. It shows no thermal effects up to 400°C. All the thermal effects below the indicated temperature are determined, therefore, by the dehydration of this salt and by phenomena connected with this process. A study was made of the change in weight and composition of magnesium selenate in order to establish the causes of the existing thermal effects on the obtained curves (Fig. 1,2), i.e., of hexahydrate and anhydrous salt during heating. The salts were calcinated in a crucible oven, into which an open corundum crucible was placed, containing the material investigated; the calcination lasted for 1 hour without admission of air into the working space of the furnace. Fig. 3 shows the change in composition of $MgSeO_4 \cdot 6H_2O$ during the calcination. At 100°C the weight loss represented 13.5%, as against the theoretical value of 13.1% in the transformation: $MgSeO_4 \cdot 6H_2O \rightarrow MgSeO_4 \cdot 4H_2O$ (1). The data of the chemical

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S/063/60/005/003/[illegible]/011/XX
A051/A029

On the Thermal Decomposition of Magnesium Selenate

analysis confirm this transformation. The Debyegram of the product obtained at 80°C is similar to the roentgenogram of previously synthesized pure $MgSeO_4 \cdot 4H_2O$; the specific gravity $d_4^{20} = 2.21$ corresponds to the same value of synthesized $MgSeO_4 \cdot 4H_2O$. Thus, the first endothermal effect (at 60°C) on the heating curve is explained by the transformation (1). The high endothermal effect at 118°C on the heating curve is explained by the further dehydration to a mixture of tetra- and monohydrates, which is accompanied by a partial reduction $Se^{6+} \rightarrow Se^{4+}$ and the partial volatilization of selenium. The effect at 260-230°C corresponds to the complete dehydration of magnesium selenate. According to the analysis the content of magnesium in the products of calcination of $MgSeO_4 \cdot 6H_2O$ at 300 and 400°C is 15.50 and 16.55% as against the theoretical value of 14.52% for $MgSeO_4$. Lines characteristic of $MgSeO_4$ are predominant on the Debyegrams of these products. The endothermal effect at 170°C is explained by the formation of the intermediary product of dehydration, the composition of which was not established. The slight exothermal effect at 450°C is determined by the oxidation of Se^{4+} to Se^{6+}, and

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On the Thermal Decomposition of Magnesium Selenate

the effect at 620°C is caused by the partial decomposition of $MgSeO_4$ with the formation of magnesium selenate. The endothermal effects on the heating curves of $MgSeO_4 \cdot 6H_2O$ and $MgSeO_4$ at 760 and 770°C correspond to the complete decomposition of magnesium selenate to magnesium oxide. The weight loss of the salts at these temperatures is about 86.03% for $MgSeO_4 \cdot 6H_2O$ and 75.68% for $MgSeO_4$ as against the theoretical values of 85.94 and 76.18%, respectively, for the transformations $MgSeO_4 \cdot 6H_2O \rightarrow MgO$ and $MgSeO_4 \cdot 4H_2O \rightarrow MgO$, respectively. The data of a chemical analysis and X-ray studies[4] confirm this transformation. The data in the table show that the liberation of the first molecules of water from magnesium selenate takes place earlier than in sulfate, but the last molecule in both salts is separated with difficulty. For magnesium sulfate this is explained by the different bond of this molecule of water with the salt (Refs. 1,4) or by its different position in the crystal lattice (Refs. 5-7). The same explanation is offered for magnesium selenate salt due to the iso-

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A051/A029

On the Thermal Decomposition of Magnesium Selenate

morphism of these salts. Comparison of the melting points of the two salts shows that the selenate is thermally less stable. This fact was established formerly (Ref 8,9). There are 3 graphs, 1 table and 9 references: 7 Soviet, 2 German.

SUBMITTED: April 16, 1959

Card 5/8

5.2610 also 2308

84215
S/078/60/005/010/010/021
B004/B067

AUTHORS: Selivanova, N. M., Shneyder, V. A., Strel'tsov, I. S.

TITLE: Thermal Decomposition of Beryllium Selenate

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 10, pp. 2272-2279

TEXT: By means of the Kurnakov pyrometer the authors took the heating and cooling curves of beryllium-selenate tetrahydrate in the temperature range 50 - 800°C (Fig. 1). They compared them with the curves obtained for anhydrous beryllium selenate (Fig. 2). From these data as well as from the analyses of the residues on ignition of $BeSeO_4 \cdot 4H_2O$ (Table 1) and $BeSeO_4$ (Table 2), of the loss on ignition of these substances (Table 3), and the Debye-Scherrer X-ray picture (Table 4), they obtained the following results: At 75°C, $BeSeO_4 \cdot 4H_2O$ passes over into $BeSeO_4 \cdot 2H_2O$. At 146°C, a further water loss occurs; and at 213°C, anhydrous $BeSeO_4$ is formed. These processes are accompanied by a partial reduction of Se^{6+} to Se^{4+} and a

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Thermal Decomposition of Beryllium Selenate

84215
S/078/60/005/010/010/021
B004/B067

partial volatilization of Se. Decomposition occurs at 460 - 560°C. BeO is formed without melting of the reaction product. As may be seen from Table 5, dehydration of $BeSeO_4 \cdot 4H_2O$ starts at a temperature lower than that of $BeSO_4 \cdot 4H_2O$. Table 6 lists the decomposition temperatures of the selenates and sulfates of the series Be, Mg, Ca, Sr, Ba. Fig. 3 shows the following thermal stability of the selenates: $BeSeO_4 < MgSeO_4 < CaSeO_4 < SrSeO_4 < BaSeO_4$. The lower thermal stability of the selenates compared to the sulfates is explained by their lower heat of formation and lattice energy. The authors mention papers by S. D. Shargorodskiy and Ya. A. Fialkov (Ref. 17) and Vikt. I. Spitsyn, and V. I. Shostak (Ref. 22). There are 3 figures, 6 tables, and 30 references: 16 Soviet, 3 US, 1 British, 4 German, 5 French, and 1 Austrian.

SUBMITTED: July 3, 1959

Card 2/2

85607

S/078/60/005/010/027/030/XX
B017/B067

5.2640 2209, 1273, 1043

AUTHORS: Selivanova, N. M., Shneyder, V. A., and Strel'tsov, I. S.

TITLE: Production of Crystal Hydrates of Magnesium Selenate

PERIODICAL: Zhurnal neorganicheskoy khimii, 1960, Vol. 5, No. 10, pp. 2269-2271

TEXT: The crystal hydrates of magnesium selenate were synthesized. The compound $MgSeO_4 \cdot 6H_2O$ was produced by dissolving a stoichiometric amount of purest magnesium oxide in selenic acid, and subsequent crystallization at room temperature. Its specific gravity is 2.01; $MgSeO_4 \cdot 6H_2O$ has the following refractive indices: Ng = 1.495 ± 0.002, Np = 1.464 ± 0.002. The interplanar spacings (d) and the relative lines of intensity of the X-ray pictures of the following compounds are summarized in a table: $MgSeO_4 \cdot 6H_2O$, $MgSeO_4 \cdot 4H_2O$, $MgSeO_4 \cdot H_2O$, and $MgSeO_4$. By heating the crystals of $MgSeO_4 \cdot 6H_2O$ in the air bath at temperatures of 40 and 70°C, a crystal hydrate $MgSeO_4 \cdot 4.5H_2O$ is formed. By heating the crystal hydrate

Card 1/2

5.4700

S/076/[illegible]
B013/[illegible]

AUTHORS: Kapustinskiy, A. F., Strel'[illegible] V. Ye., Alapina, A. V., [illegible]

TITLE: Specific Heat at Low Temperature, [illegible] and Free Energy of Formation of [illegible]

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol. [illegible] pp. 1088-1095

TEXT: The authors measured the specific heat [illegible] 300°K, and by extrapolation they obtained [illegible] from 0° to 65°K. Measurements were made by [illegible] meter (Fig. 1). The design of the [illegible] was taken from a paper by O. N. Trapeznikova and [illegible] A. I. Sudovtsov, collaborator of the [illegible] AN USSR (Institute of Physics and Technology of [illegible] in the construction of the ampoule and in [illegible] thermometer. A vacuum of 10^{-6} torr was attained [illegible] of a forepump of the type BH-461 ([illegible]) [illegible] type MH-40 (MN-40). Table 1 offers measured values [illegible]

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ture dependence of the specific heat of lead oxalate. The absolute entropy for lead oxalate amounts to $S_{298.16} = 34.9 \pm 1.6$ e.u. The solubility of lead oxalate was determined polarographically in water at 25°C (Table 2). On the strength of these and thermochemical measurements the following thermal constants were obtained for lead oxalate: the free [illegible] energy of PbC_2O_4 in water (at 25°C) = -13.00 kcal/mole; solution heat of PbC_2O_4 in water = -9.17 kcal/mole; free energy and heat of formation of PbC_2O_4 from the elements under standard conditions - 180.91 kcal/mole or 206.24 kcal/mole, respectively. By considering the specific heat of lead oxalate at low temperature, as well as the free energy and precipitation heat of lead oxalate from aqueous solutions, the entropy of the oxalate ion in water was found to be $S_{298.16} = 15 \pm 2$ e.u. I. V. Tananayev and I. B. Mizetskaya, as well as O. Ya. Samoylov are mentioned in the text. There are 2 figures, 2 tables, and 13 references: 7 Soviet, 3 American, 1 French, and 1 German.

Card 2/3

ASSOCIATION: Khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva, Moskva (Institute of Chemical Technology imeni D. I. Mendeleyev, Moscow). Politekhnicheskiy institut im. V. I. Lenina, Khar'kov (Polytechnic Institute imeni V. I. Lenin, Khar'kov)

SUBMITTED: July 21, 1958

Card 3/3

SELIVANOVA, N.M.; PAKHORUKOV, N.I.

Heats of solution of selenious acid. Izv.vys.ucheb.zav.;khim.i khim.tekh. 4 no.3:355-358 '61. (MIRA 14:10)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni Mendeleyeva, kafedra obshchey i neorganicheskoy khimii.
(Selenious acid)
(Heat of solution)

SELIVANOVA, N.M.; SHNEYDER, V.A.; RYABOVA, R.I.

Heat of formation of magnesium selenate from the elements. Zhur. neorg. khim. 6 no.1:27-33 '61. (MIRA 14:2)
(Magnesium selenate) (Heat of formation)

54780 1067, 1273, 1160

S/076/61/035/003/009/023
B121/B203

AUTHORS: Selivanova, N. M. and Shneyder, V. A.

TITLE: Physicochemical properties of selenates. X. Heat of formation of beryllium selenate from elements

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 3, 1961, 574-579

TEXT: The heat of reaction of beryllium selenate tetrahydrate with an aqueous solution of barium chloride at 25°C was determined with an isothermal calorimeter. The heats of formation of the crystalline beryllium salts $BeSeO_4 \cdot 4H_2O$, $BeSeO_4 \cdot 2H_2O$, and $BeSeO_4$ were also determined. $BeSeO_4 \cdot 4H_2O$ was supplied by the "Krasnyy khimik" plant and recrystallized twice before use. The correct composition of this salt was confirmed by chemical analysis. The heat of formation of $BeSeO_4 \cdot 4H_2O$ is: $\Delta H^{\circ}_{298.16} = -505.54$ kcal/mole. The heat of formation of crystalline $BeSeO_4 \cdot 2H_2O$ from elements was determined from the hydration heat of this salt by the equation:
$BeSeO_4 \cdot 2H_2O_{cryst} + 2H_2O_{liqu} = BeSeO_4 \cdot 4H_2O_{cryst} + Q_{hydration}$. Compound

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Physicochemical properties ...

$BeSeO_4 \cdot 2H_2O$ was obtained from $BeSeO_4 \cdot 4H_2O$ by storing in an exsiccator over P_2O_5 within 10 days. For $BeSeO_4 \cdot 2H_2O$, $\Delta H^o_{298.16} = -360.82$ kcal/mole. $BeSeO_4$ was obtained by dehydration of $BeSeO_4 \cdot 2H_2O$ in a thermostat at 215-220°C within 6 days. To determine the hydration heat of $BeSeO_4$, the authors first determined the heats of solution of $BeSeO_4 \cdot 2H_2O$ and $BeSeO_4$ in 1.0 N KOH (dilution 1 : 3600) at 25°C. The mean heat of solution of $BeSeO_4 \cdot 2H_2O$ is 26.23 ± 0.15 (± 0.60%) kcal/mole, that of $BeSeO_4$ is 37.15 ± 0.20 (± 0.55%) kcal/mole. The value $\Delta H^o_{298.16} = -213.26$ kcal/mole was found for the heat of formation of $BeSeO_4$ from elements. The heats of formation of beryllium selenates are lower than those of beryllium sulfates; this indicates that beryllium selenates are unstabler compounds than the corresponding sulfates. There are 5 tables and 20 references: 9 Soviet-bloc and 11 non-Soviet-bloc. The four most recent references to English-language publications read as follows: G. Marchal, J. Chem. Phys., 22, 342, 1925; K. K. Kelley, Bull. Bur. Mines (USA), 406, 1937; F. Rossini,

Physicochemical properties ...

S/076/61/035/003/009/023
B121/B203

D. Wagman, W. Evans, L. Levine, I. Iaffe, Selected values of chemical thermodynamic properties, Nat. Bur. Standards, 1952, Washington; N. V. Sidgwick, N. B. Lewis, J. Chem. Soc., London, 1290, 1926.

ASSOCIATION: Khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva Moskva (Institute of Chemical Technology imeni D. I. Mendeleyev, Moscow)

SUBMITTED: July 1, 1959

X

Card 3/3

SELIVANOVA, N.M.; SHNEYDER, V.A.; SAZYKINA, T.A.

Physicochemical properties of selenates. Part 12: Heat of formation of lithium selenates from elements. Izv.vys.ucheb.zav.;-khim.i khim.tekh. 5 no.2:183-187 '62. (MIRA 15:8)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva kafedra obshchey i neorganicheskoy khimii.
(Lithium selenates) (Heat of formation)

SELIVANOVA, N.M.; ZUBOVA, G.A.; KALINKINA, A.A.; SAZYKINA, T.A.

Physicochemical properties of selenates. Part 15: Behavior of rubidium selenate during heating. Izv.vys.uch.zav.; khim.i khim.tekh. 5 no.4:524-528 '62. (MIRA 15:12)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva, kafedra obshchey i neorganicheskoy khimii.
(Rubidium selenate)

33276
S/078/62/007/002/002/019
B119/B110

S 2400 1087

AUTHORS: Selivanova, N. M., Sazykina, T. A.

TITLE: Thermal decomposition of lithium selenate

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 7, no. 2, 1962, 240 - 243

TEXT: The investigation of the thermal behavior of selenates is of interest for the recovery of Se from sludge; the production of luminophores, enamels, and glazes; and in the glass industry. Thermal analysis of $Li_2SeO_4 \cdot H_2O$ was performed with a recording Kurnakov pyrometer (heating rate 6 - 8 deg/min; temperature measuring with a Pt - Pt/Rh thermocouple). The decomposition products were studied by chemical and x-ray diffraction analyses. The change in weight of the substance with increasing temperature was studied. Results: $Li_2SeO_4 \cdot H_2O$ shows three significant endothermic effects. The first effect at 150 - 190°C corresponds to the reaction $LiSeO_4 \cdot H_2O \longrightarrow Li_2SeO_4$; Se^{6+} is partly reduced to Se^{4+}. The second effect (at 680 - 690°C) corresponds to the congruent

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Thermal decomposition of...

melting of Li_2SeO_4. At 840°C (third effect) the melted Li_2SeO_4 is decomposed as follows: $Li_2SeO_4 \longrightarrow Li_2SeO_3 + 1/2\ O_2$. A paper by V. I. Spitsyn, V. I. Shostak (Ref. 11: Zh. obshch. khimii, 19, 1801 (1949)) is mentioned among others. There are 1 figure, 1 table, and 16 references: 6 Soviet and 10 non-Soviet. The four references to English-language publications read as follows: V. Lehner, E. Wechter, J. Amer. Chem. Soc., 47, 1523 (1925); D. F. Adams, L. I. Gilberston, Ind. Eng. Chem. Anal. Ed., 14, 926 (1942); L. R. Rogers, F. K. Calley, Ind. Eng. Chem. Anal. Ed., 15, 209 (1943); R. M. Gruver, J. Amer. Ceram. Soc., 34, 353 (1951).

SUBMITTED: February 24, 1961

Card 2/2

SELIVANOVA, N.M.; SAZYKINA, T.A.

Heat of formation of sodium selenate decahydrate. Zhur.neorg.khim. 7 no.3:536-539 Mr '62. (MIRA 15:3)
(Sodium selenates) (Heat of formation)

SELIVANOVA, N.M.; MAYYER, A.I.; SAMPLAVSKAYA, K.K.

Thermal decomposition of copper selenate. Zhur.neorg.khim. 7 no.5:1074-1083 My '62. (MIRA 15:7)
(Copper selenate--Thermal properties)

S/076/62/036/006/007/011
B117/B138

AUTHORS: Selivanova, N. M., Leshchinskaya, Z. L., and Klushina, T. V.

TITLE: Physical and chemical properties of selenites. I. Thermodynamic properties of silver selenite

PERIODICAL: Zhurnal fizicheskoy khimii, v. 36, no. 6, 1962, 1349 - 1352

TEXT: This is a short report on a study of the thermodynamic properties of silver selenite. The heat of precipitation of silver selenite from aqueous solutions (mean value 10.68 ± 0.05 kcal/mole) was measured and its solubility in water (mean value $2.85 \cdot 10^{16}$) determined under normal conditions (25°C). From the results, the formation of silver selenite

$$2Ag_{cryst} + Se_{cryst} + 3/2\ O_{2\ gas} = Ag_2SeO_{3\ cryst}$$

from elements, change in free energy (isobaric potential), and the heat of formation were calculated: $\Delta Z^o_{298.16} = -73.64$ kcal/mole, $\Delta H^o_{298.16} = -82.45$ kcal/mole. From the values obtained, the absolute entropy of crystalline silver selenite was determined: $S^o_{298.16} = 74.36$ entropy units,

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and from it, the entropy of a hydrous selenite ion was calculated: $S^{o}_{298.16}$ = 3.92 entropy units. This is consistent with the figure (3.9 entropy units) found by F. Rossini, D. Wagman, W. Evans, S. Levine and I. Jaffe (Selected values of chemical thermodynamic properties, Washington, 1952) in experiments with selenic acid. There are 1 figure and 3 tables.

ASSOCIATION: Khimiko-tekhnologicheskiy institut im. D. I. Mendeleyeva (Institute of Chemical Technology imeni D. I. Mendeleyev)

SUBMITTED: August 22, 1961

KUDRYAVTSEV, A.A.; SELIVANOVA, N.M.; DRAKIN, S.I., dots.; MAYYER, A.I.; SAMPLAVSKAYA, K.K.; SOLOKHIN, V.A.; STAKHANOVA, M.S.; BUNDEL', A.A., prof., retsenzent; KARAPET'YANTS, M.Kh., doktor khim. nauk, prof., red.; MEL'NIKOVA, T.I., red.

[Laboratory work in general and inorganic chemistry] Praktikum po obshchei i neorganicheskoi khimii. [By] A.A.Kudriavtsev i dr. Moskva, Mosk. khimiko-tekhnol. in-t im. D.I.Mendeleeva. Pt.2. [Work in the chemistry of elements] Raboty po khimii elementov. 1963. 122 p. (MIRA 16:10)
(Chemistry--Laboratory manuals)
(Chemical elements)

SELIVANOVA, N.M.; SAZYKINA, T.A.

Physicochemical study of selenates. Part 21: Heat of formation of rubidium selenate. Izv.vys.ucheb.zav.; khim.i khim.tekh. 6 no.4: 531-533 '63. (MIRA 17:2)

1. Moskovskiy khimiko-tekhnologicheskiy institut im. Mendeleyeva. Kafedra obshchey i neorganicheskoy khimii.

SELIVANOVA, N.M.; KARAPET'YANTS, M.Kh.

Approximate evaluation of the molar volumes of selenates. Izv.vys.ucheb. zav.; khim.i khim.tekh. 6 no.4:534-542 '63. (MIRA 17:2)

1. Moskovskiy khimiko-tekhnologicheskiy institut im. Mendeleyeva. Kafedra neorganicheskoy khimii.

SELIVANOVA, N.M.; KARAPET'YANTS, M.Kh.

Energy of crystal lattices of sulfates, selenates, tellurates.
Izv.vys.ucheb.zav.; khim. i khim. tekh. 6 no.6:891-895 '63.
(MIRA 17:4)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni Mendeleyeva. kafedra obshchey i neorganicheskoy khimii.

S/078/63/008/003/003/020
B117/B186

AUTHORS: Selivanova, N. M., Leshchinskaya, Z. L.

TITLE: Thermodynamic properties of strontium selenite

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 8, no. 3, 1963, 563-566

TEXT: The heat of the reaction between strontium chloride and sodium selenite was measured at 25°C using a calorimeter described earlier (N.M. Selivanova, A.F. Kapustinskiy, G. A. Zubova, Izv. AN SSSR, Otd. khim. n., no.2, 187 (1959)). The values obtained and the data determined by V.G. Chukhlantsev for the solubility of strontium selenite were used to calculate the heat of formation of strontium selenite, the isobaric potential, and the entropy of crystalline $SrSeO_3$ and of SeO_{3aq}^{2-} under standard conditions. ΔH^o_{298} = -250.55 kcal and ΔZ^o_{298} = -230.84 kcal were found for the reaction $Sr_{cryst} + Se_{cryst} + 3/2\ O_{2\ gas} = SrSeO_{3\ cryst}$. Standard entropy of crystalline $SrSeO_3$: S^o_{298} = -30.36 entropy units. Entropy of the aqueous ion: S^o_{298} = -4.07 entropy units. There are 1

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Thermodynamic properties of ...

S/078/63/008/003/003/020
B117/B186

figure and 1 table.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut im. D.I. Mendeleyeva (Moscow Institute of Chemical Technology imeni D. I. Mendeleyev)

SUBMITTED: May 7, 1962

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S/078/63/008/003/016/020
B117/B186

AUTHORS: Leshchinskaya, Z. L., Selivanova, N. M., Strel'tsov, I. S.

TITLE: Heat of formation of barium selenite

PERIODICAL: Zhurnal neorganicheskoy khimii, v. 8, no. 3, 1963, 763-764

TEXT: The heat of formation of barium selenite in the reaction of sodium selenite with barium chloride was measured in a calorimeter at 25°C for the first time. The presence of crystalline barium selenite was proved by x-ray diffraction analysis. The standard heat calculated according to Hess's law was $\Delta H^{\circ}_{298} = -249.31$ kcal/mole. There are 1 figure and 1 table.

ASSOCIATION: Moskovskiy khimiko-tekhnologicheskiy institut im. D.I. Mendeleyeva (Moscow Institute of Chemical Technology imeni D.I. Mendeleyev)

SUBMITTED: May 7, 1962

Card 1/1

LESHCHINSKAYA, Z.L.; SELIVANOVA, N.M.; MAYYER, A.I.; STREL'TSOV, I.S.; MUZALEV, Ye.Yu.

Heats of formation of nickel selenites and cobalt selenites. Zhur. VKHO 8 no.5:577-578 '63. (MIRA 17:1)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni Mendeleyeva.

SELIVANOVA, N.M.; MAYYER, A.I.; LUK'YANOVA, T.A.

Heat of formation of Zn selenate. Zhur. neorg. khim. 8 no.11:2428-2433 N '63. (MIRA 17:1)

MAYYER, A.I.; SAMPLAVSKAYA, K.K.; SELIVANOVA, N.M.

Thermal decomposition of copper selenite. Zhur. prikl. khim. 36 no.8:1659-1664 Ag '63. (MIRA 16:11)

S/076/63/037/003/013/020
B101/B215

AUTHORS: Selivanova, N. M., Leshchinskaya, Z. L., Strel'tsov, N. S.

TITLE: Formation heat of cadmium selenite

PERIODICAL: Zhurnal fizicheskoy khimii, v. 37, no. 3, 1963, 668-670

TEXT: The standard heat of formation of $CdSeO_3$ was determined calorimetrically by causing $CdCl_2$ to react with Na_2SeO_3. Radiographically amorphous $CdSeO_3$ was obtained and ΔH^o_{298} = -137.04 kcal/mole was found on the basis of data obtained by F. Rossini et al. (Selected values of chemical thermodynamic properties, Washington, 1952). The integral heat of solution of crystalline Na_2SeO_3 is -7.05 kcal/mole for a concentration of 1 : 400. There are 1 figure and 2 tables.

ASSOCIATION: Moskovskiy ordena Lenina khimiko-tekhnologicheskiy institut imeni D. I. Mendeleyeva (Moscow "Order of Lenin" Institute of Chemical Technology imeni D. I. Mendeleyev)

S/076/63/037/003/013/020
B101/B215

Formation heat of cadmium selenite

SUBMITTED: April 27, 1962

Card 2/2

SELIVANOVA, N.M.; LESHCHINSKAYA, Z.L.; MAYYER, A.I.; STREL'TSOV, I.S.; MUZALEV, Ye.Yu.

Thermodynamic properties of $NiSeO_3 \cdot 2H_2O$. Zhur.fiz.khim. 37 no.7:1563-1567 Jl '63. (MIRA 17:2)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni Mendeleyeva.

SELIVANOVA, N.M.; MAYYER, A.I.; LUK'YANOVA, T.A.

Physicochemical properties of selenates. Zhur.fiz.khim. 37 no.7:1588-1592 Jl '63. (MIRA 17:2)

1. Moskovskiy khimiko-tekhnologicheskiy institut imeni Mendeleyeva.

SELIVANOVA, N.M.; LESHCHINSKAYA, Z.L.

Heat of transition of a nonequilibrium (amorphous) form of nickel selenite to an equilibrium (crystalline) one. Zhur. neorg. khim. 9 no.2:259-263 F'64. (MIRA 17:2)

SELIVANOVA, N.M. [illegible]

[illegible] of the [illegible] entropies of crystalline selenates. Zhur. fiz. khim. 37 no.[illegible] 85[illegible]-855 [illegible] '63.

(MIRA 17:7)

1. Khimiko-tekhnologicheskiy institut imeni D.I. Mendeleyeva.

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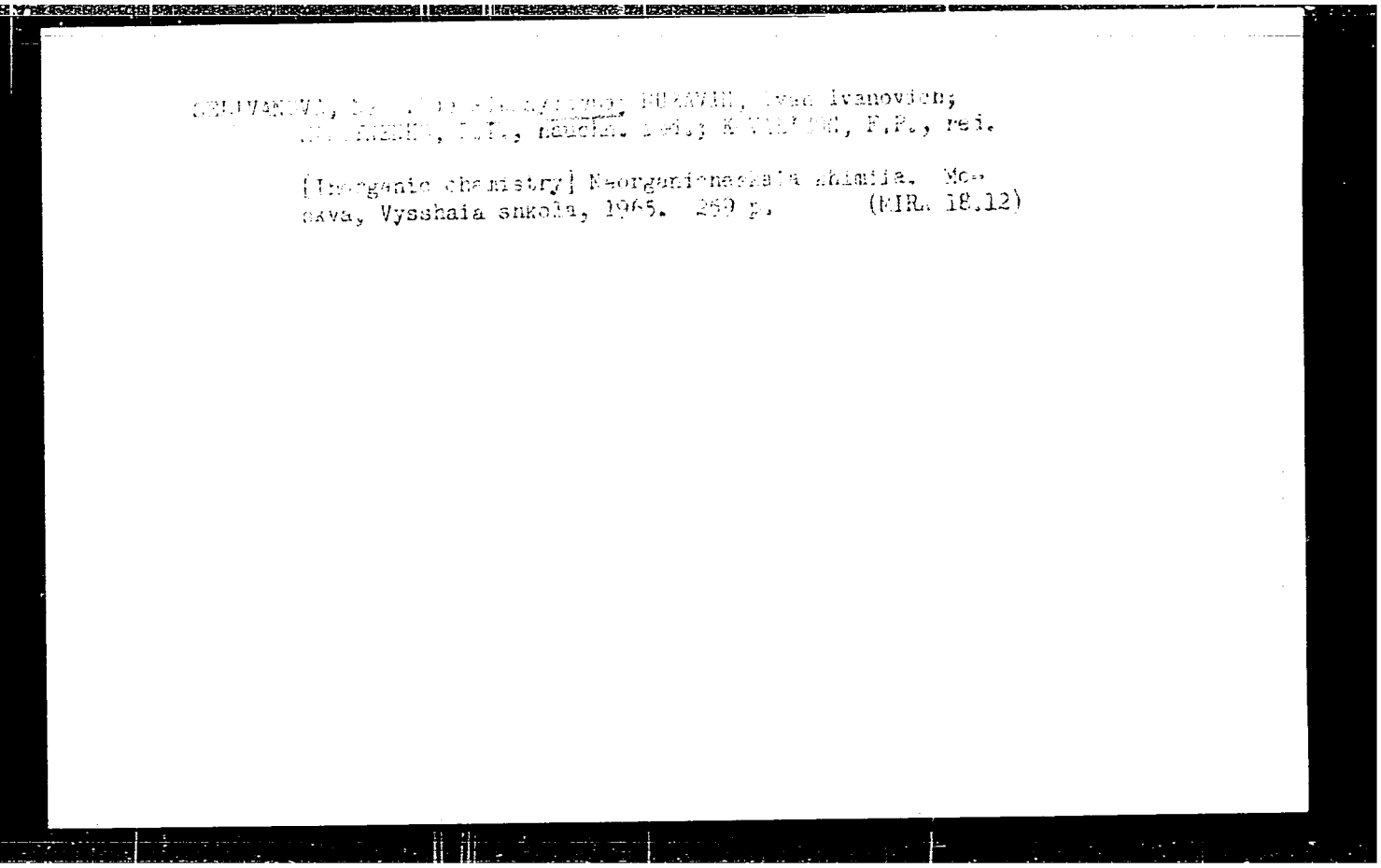

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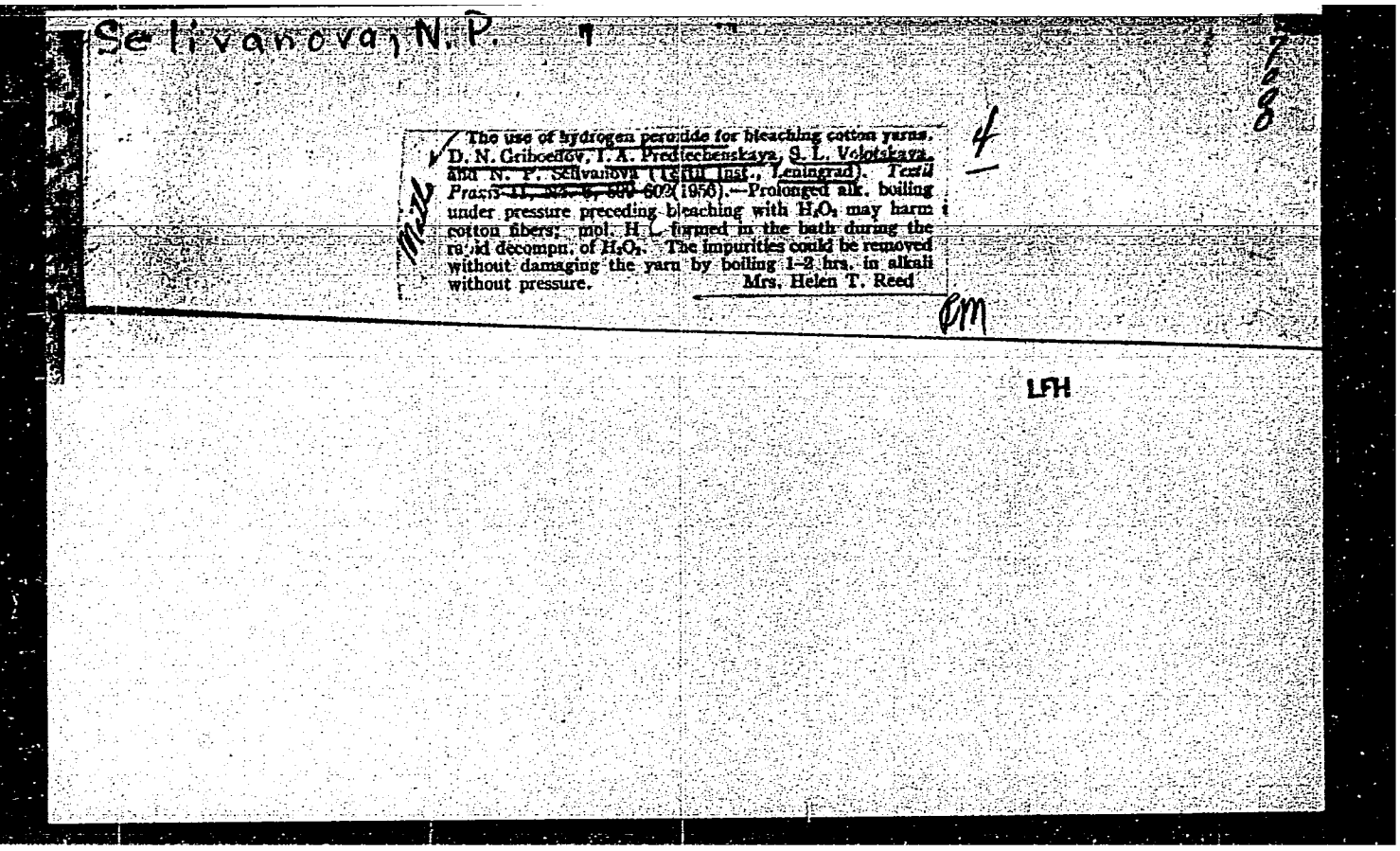

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GRIBOYEDOV, D.N., professor; PREDTECHENSKAYA, I.A., dotsent; VOLOTSKAYA, S.L., inzhener; SELIVANOVA, M.P., inzhener.

The use of hydrogen peroxide for bleaching cotton fabrics of doubled yarns. Tekst.prom. 16 no.2:36-39 F '56. (MLRA 9:5)
(Hydrogen peroxide) (Cotton finishing) (Bleaching)

BOGDANOV, K.A., SELIVANOVA, N.V.

Certain esters of undecylenic acid. Masl.-zhir.prom. 25 no.11:32-33 '59. (MIRA 13:3)

1. Kaluzhskiy kombinat sinteticheskikh dushistykh veshchestv.

(Undecenoic acid)

SELIVANOVA, N.V.

Measures for controlling helminthiasis in animals in Moldavia. Veterinariia no.12:6-8 D '63. (MIRA 17:2)

1. Starshiy veterinarnyy vrach Upravleniya veterinarii Ministerstva proizvodstva i zagotovok sel'skokhozyaystvennykh produktov Moldavskoy SSR.

SHLYAKOV, N. YA.

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Variability of the size of cell nuclei in inter-varietal hybridization and graftage of trees. Trudy Inst. lesa 8, 1951.

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SELIVANOVA, R.A.

Prevention of epidermophytosis in certain industries at Kazan. (MIRA 15:2)
Kaz. med. zhur. no.4:88-91 Jl-Ag '61.

1. Kafedra kozhnykh i venericheskikh bolezney (zav. - prof. N.N. Yasnitskiy) Kazanskogo meditsinskogo instituta.
(KAZAN--DERMATOMYCOSIS)

SELIVANOVA, R. G.

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(Dissertation for Degree of Candidate in Pedagogical Sciences).

SO: Knizhnaya letopis', No 23, 1956

SUBJECT USSR/MATHEMATICS/Theory of approximations CARD 1/2 PG - 147
AUTHOR SELIVANOVA S.G.
TITLE Asymptotic estimations of the approximations of differentiable nonperiodic functions by Čebyšev sums.
PERIODICAL Doklady Akad. Nauk 104, 648-651 (1955)
reviewed 7/1956

Let $W^{(r)}_k$ be the class of those functions $f(x)$ which are defined on $[-1,+1]$ and which there possess a derivative of r-th order $f^{(r)}(x)$ which satisfies the inequation $|f^{(r)}(x)| \leq k$, $k = \text{const}$. Let further $U_n(f,x) = \frac{a_0}{2} + \sum_{k=1}^{n-1} a_k P_k(x)$ be the sum of the first n terms of the decomposition of f into a series in terms of Čebyšev polynomials, where $P_k(x) = \cos k \arccos x$, $a_k = \frac{2}{\pi}\int_{-1}^{+1} \frac{f(t)P_k(t)}{\sqrt{1-t^2}}\,dt$.
It is shown that for arbitrary $r \geq 1$

$$\sup_{f \in W^{(r)}_k} |f(x) - U_n(f,x)| = \frac{4}{\pi^2} \frac{k \log n}{n^r} \left(\sqrt{1-x^2}\right)^r + \varepsilon_{n,r},$$

where $|\varepsilon_{n,r}| \leq Cr/n^r$, $C = \text{const}$. Let $W^{(r)}_0{}_k$ be the class of those functions $f(x)$ which are defined on $[-1,+1]$ and the r-th derivatives of which there satisfy the inequation

$$\left(\int_{-\pi}^{\pi} \left| f^{(r)}(x) \right|^p dx \right)^{1/p} \leq k \qquad p \geq 1.$$

Then for $r \geq \frac{2}{p}$ uniformly with respect to $x \in [-\pi, \pi]$ the asymptotic equation

$$\sup_{f \in W_p^{(r)}{}_k} \left| f(x) - U_n(f,x) \right| = \frac{\nu(r-1,q)}{\pi n^{r-1+\frac{1}{q}}} \cdot \sqrt[p]{\pi} + O\left(\frac{1}{n^r} \right)$$

is valid, where

$$\nu(r-1,q) = \frac{1}{\Gamma(r)} \left(\int_{-\infty}^{+\infty} |\varphi(r,t)|^q dt \right)^{1/q}$$

$$\varphi(r,t) = \int_0^{\infty} e^{-v} v^{r-1} \frac{v \cos\left(t + \frac{r\pi}{2}\right) - t \sin\left(t + \frac{r\pi}{2}\right)}{v^2 + t^2} dv, \quad \frac{1}{p} + \frac{1}{q} = 1.$$

Furthermore without proof two theorems on the estimation of the approximation of the function $f(x)$ which possesses derivatives of bounded variation are formulated. All results base essentially on the results of Nikolskij.

INSTITUTION: Lomonosov University Moscow.

SUBJECT USSR/MATHEMATICS/Fourier series CARD 1/1 PG - 194
AUTHOR SELIVANOVA S.G.
TITLE The approximation by Fourier sums of functions the derivative of which satisfies the Lipschitz condition.
PERIODICAL Doklady Akad. Nauk 105, 909-912 (1955)
reviewed 8/1956

In 1945 Nikol'skij has proved the following theorem: For arbitrary numbers r and α ($r \geq 0$, $0 \leq \alpha \leq 1$) the following asymptotic equation is valid:

$$\sup_{f \in w} |f(x) - S_n(f,x)| = \frac{2^{\alpha+1} K}{\pi^2} \frac{\log n}{n^{r+\alpha}} \int_0^{\pi/2} v^{\alpha} \sin v \, dv + \varepsilon_{n,r},$$

where $\varepsilon_{n,r} = O\left(\frac{1}{n^{r+\alpha}}\right)$ is independent of x. Here S_n is the sum of the first n terms of the Fourier series for f and w is the class of the 2π-periodic functions, which possess a derivative of r-th order in the sense of Weyl which satisfies the Lipschitz condition with the power α and the constant K.

In the present paper it is shown that $|\varepsilon_{n,r}| < \frac{Cr}{n^{r+\alpha}}$, where C is an absolute constant.

INSTITUTION: Lomonossov University Moscow.

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1. Institut obshchey i neorganicheskoy khimii AN UkrSSR.
(Chemical apparatus)

SELIVANOVA, S. N., ZHUKOVSKIY, A. V.

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1. Voronezhskaya stantsiya zashchity rasteniy. Predstavlena sektsiyey zashchity rasteniy Vsesoyuznoy ordena Lenina akademii sel'skokhozyaystvennykh nauk imeni V.I. Lenina.
(Eurygasters) (Wheat--Diseases and pests)

SELIVANOVA, S.N.

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BATIASHVILI, I.D.; BEY-BIYENKO, G.Ya.; BOGDANOV-KAT'KOV, N.N.; GERASIMOV, B.A.; GILYAROV, M.S.; DMITRIYEV, G.V.; ZVEREZOMB-ZUBOVSKIY, Ye.V.; ZIMIN, L.S.; KOLOBOVA, A.N.; MEDVEDEV, S.I.; MISHCHENKO, A.I.; PETROV, A.I.; RYABOV, M.A.; SAVZDARG, E.E.; SELIVANOVA, S.N.; SKORIKOVA, O.A.; TROPKINA, M.F.; SHAPOSHNIKOV, G.Kh.; SHCHEGOLEV, V.N., prof., doktor sel'skokhoz.nauk; ESTERBERG, L.K.; YAKHONTOV, V.V.; REUTSKAYA, O.Ye., red.; CHUNAYEVA, Z.V., tekhn.red.

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Detecting pea weevils. Zashch. rast. ot vred. i bol. 9 no.12: 31-32 '64. (MIRA 18:4)

1. Voronezhskaya stantsiya Vsesoyuznogo instituta zashchity rasteniy.

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