NIKOLAYEVSKIY, A.A.; TYURIN, M.N.

Materials on the tectonic regionalization of the Uchaly region, based on geophysical data. Mat. po geol. i pol. iskop. IUzn. Urala no.3:55-62 '62. (MIRA 17:7)

NIKOLAYEVSKIY, A.A.; TYURIN, M.N.

Some characteristics of the subsurface geology of the Magnitogorsk synclinorium based on geophysical data. Sov. geol. 6 no.5:93-103 My '63. (MIRA 16:6)

1. Severo-Vostochnyy kompleksnyy nauchno-issledovatel'skiy institut.
(Ural Mountains--Geology, Structural)

TYURIN, M.T.

The plan for 1962 should be fulfilled ahead of time. Avt.dor. 25 no.4:32 Ap '62. (MIRA 15:5)
(Road construction)

TYURIN, M.T., inzh.

Major repairs to pile supports of large wooden bridges. Avt. dor. 22 no.6:6-7 Je '59. (MIRA 12:9)
(Bridges, Wooden--Maintenance and repair)

TYURIN, N. (Yaroslavl')

Workers of the Yaroslavl power sypply system improve economic indices. Zhil-komm. khoz. 9 no.3:20 '59. (MIRA 12:5)

1.Nachal'nik planovogo otdela Yaroslavskoy gorodskoy elektroseti.
(Yaroslavl--Electric power distribution)

ZAYTSEVA, N.M., kandidat meditsinskikh nauk; AZAROVA, S.A., ordinator; TYURIN, N.A., ordinator; MOTOVILOVA, Ye.A., ordinator

Oxygen treatment for ascariasis. Pediatriia no.3:69-72 My-Je '54. (MLRA 8:1)

1. Iz kliniki detskikh bolezney (zaveduiushchiy kafedroy - deystvitel'nyy chlen Akademii meditsinskikh nauk SSSR professor Yu.F.Dombrovskaya) I Moskovskogo ordena Lenina meditsinskogo instituta.

(ASCARIDS AND ASCARIASIS) (OXYGEN--THERAPEUTIC USE)

TYURIN, N.A.; KOLESOV, D.V.

Functional disorders of the nervous system in children with bronchial asthma. Zhur. nevr. i psikh. 65 no.7:999-1003 '65. (MIRA 18:7)

1. Kafedra detskikh bolezney (zav. - prof. Yu.F.Dombrovskaya) I Moskovskogo ordena Lenina meditsinskogo instituta imeni Sechenova.

TYURIN, N.A.; KARTASHEVA, V.I.

Pulmonary atelectasis in a child during a seizure of bronchial asthma. Vop.okh.mat.i det. 7 no.7:76-78 Jl '62. (MIRA 15:11)

1. Iz kliniki detskikh bolezney (zav. - deystvitel'nyy chlen AMN SSSR prof. Yu.F.Dombrovskaya) I Moskovskogo ordena Lenina meditsinskogo instituta imeni I.M.Sechenova.
(ASTHMA) (LUNGS--COLLAPSE)

TYURIN N.A.

EXCERPTA MEDICA Sec 7 Vol 13/5 Pediatrics May 59

1165. TREATMENT OF ASTHMA IN CHILDREN (Russian text) - Tyurin N. A. PEDIATRIYA 1958, 2 (71-75)

Methods used in the treatment of 78 cases of asthma in children aged 1-13 yr. were as follows: Cupping glasses, warm footbaths, adrenaline administration into the nose and ephedrine were used in the prodromal period. Attacks were arrested by placing the child in a semi-sitting position and administration of adrenaline, ephedrine and a mixture ('theophedrine') of theophylline, theobromine, caffeine, aminopyrine, phenacetin, ephedrine, folia belladonnae, phenobarbital and lobeline (or cytisine). Treatment in periods between attacks comprised regular habits, rational diet, vitamin supplements, fresh air and exercises. Traskov's mixture and 10-(2-dimethylaminoethyl phenothiazine ('ethizine') were also tried. All affections of the nasopharynx were treated. Sapinski - Ostrów Wlkp (VII, 15*)

USSR/Human and Animal Physiology (Normal and Pathological). Respiration.

Abs Jour: Ref Zhur-Biol., No 17, 1958, 79618.

Author : Tyurin, N.A.
Inst :
Title : Fluctuations of Arterial Pressure During Difficult Breathing in Patients with Bronchial Asthma.

Orig Pub: Pediatriya, 1957, No 9, 41-44.

Abstract: In 46 patients with bronchial asthma, the arterial pressure (AP) was measured (according to Korotkov). A higher maximal AP was noted during exhalation and a drop in it during inhalation. The magnitude of the respiratory fluctuations of AP, used by the author as the inhalation-exhalation difference, occur parallel to the degree of difficulty of

Card : 1/2

USSR/Human and Animal Physiology (Normal and Pathological).
Respiration.

Abs Jour: Ref Zhur-Biol., No 17, 1958, 79618.

breathing. An increase of this difference prevents the appearance of an attack of bronchial asthma, and its determination can aid objective evaluation of the difficulty of breathing.

Card : 2/2

KODOLOVA, I.M., TYURIN, N.A.

Clinical and anatomical observation of bronchial asthma in a 3 1/2-year old child [with summary in English]. Pediatriia 36 no.9:26-33 D '58 (MIRA 11:11)

1. Iz kafedry patologicheskoy anatomii (zav. - chlen-korresonpondent AMN SSSR prof. A.I. Strukov) i kafedry detskikh bolezney (zav. - deystvitel'nyy chlen AMN SSSR prof. Yu.F. Dombrovskaya) I Moskovskogo ordena Lenina meditsinskogo instituta imeni I.M. Sechenova.
(ASTHMA, in inf. & child.
clin. picture & pathol. (Rus))

TYURIN, N.A.

Fluctuations of arterial blood pressure due to difficult breating in bronchial asthma. Pediatriia no.9:41-44 S '57. (MIRA 10:11)

1. Iz kliniki detskikh bolezney (zav. - deystvitel'nyy chlen AMN SSSR prof. Yu.F.Dombrovskaya) I Moskovskogo ordena Lenina meditsinskogo instituta imeni I.M.Sechenova.
(BLOOD PRESSURE) (DYSPNEA) (ASTHMA)

TYURIN, M.A.

Treating bronchial asthma in children [with summary in English]. Pediatriia 36 no.2:71-75 F '58. (MIRA 11:3)

1. Iz kliniki detskikh bolezney (dir. - deystvitel'nyy chlen AMN SSSR prof. Yu.F.Dombrovskaya) I Moskovskogo ordena Lenina meditsinskogo instituta imeni I.M.Sechenova.
(ASTHMA)

TYURIN, N.A., kand.med.nauk

Changes in the capillariscopic picture in bronchial asthma in children. Pediatriia no.9:48-50 '61. (MIRA 14:8)

1. Iz kliniki detskikh bolezney I Moskovskogo meditsinskogo instituta imeni I.M. Sechenova (zav. - deystvitel'nyy chlen AMN SSSR prof. Yu.F. Dombrovskaya).
(ASTHMA) (CAPILLARIES)

EXCERPTA MEDICA Sec 15 Vol 12/8 Chest Dis. Aug 59

1890. TREATMENT OF ASTHMA IN CHILDREN (Russian text) - Tyurin N.A. - PEDIATRIYA 1958, 2 (71-75)

Methods used in the treatment of 78 cases of asthma in children aged 1-13 yr. were as follows: Cupping glasses, warm footbaths, adrenaline administration into the nose and ephedrine were used in the prodromal period. Attacks were arrested by placing the child in a semi-sitting position and administration of adrenaline, ephedrine and a mixture ('theophedrine') of theophylline, theobromine, caffeine, aminopyrine, phenacetin, ephedrine, folia belladonnae, phenobarbital and lobeline (or cytisine). Treatment in periods between attacks comprised regular habits, rational diet, vitamin supplements, fresh air and exercises. Traskov's mixture and 10-(2-dimethylaminoethyl)phenothiazine ('ethizine') were also tried. All affections of the nasopharynx were treated. Sapinski - Ostrów Wilkp (VII, 15)

TYURIN, N.A. (Moskva)

Clinical aspects and therapy of scarlet fever. Fel'd. i akush. (MLRA 7:8)
no.8:12-17 Ag '54.
(SCARLET FEVER, therapy,)

TYURIN, N. A.: Master Med Sci (diss) -- "The cardiovascular system in bronchial asthma of children". Moscow, 1959. 12 pp (First Moscow Order of Lenin Med Inst im I. M. Sechenov), 200 copies (KL, No 12, 1959, 133)

TYURIN, N.A.; KULINICH, Yu.A.

Spontaneous pneumothorax during an attack of bronchial asthma in children. Pediatriia 4 no.7:66-68 Jl '63 (MIRA 16:12)

1. Iz kliniki detskikh bolezney (dir.-deystvitel'nyy chlen AMN SSSR prof. Yu.F.Dombrovskaya) I.Moskovskogo ordena Lenina meditsinskogo instituta imeni I.M.Sechenova.

TYURIN, N.A. (Moskva)

Bronchial asthma in children. Fel'd. i akush. 22 no.3:14-19 Mr '57. (MLRA 10:5)

(ASTHMA)

TYURIN, N.A.; MARISENKO, G.P.

Use of electric aerosol devices in the treatment of bronchial asthma and chronic pneumonia in children. Nov. med. tekh. no.3: 139-142 '65. (MIRA 19:1)

LEGEYDA, N.F.; TYURIN, N.F.; NOSOV, V.S.

Investigatinf the mechanical properties of thick St. 3kp steel sheet made from various parts in height of an ingot, before and after heat treatment. Sbor. trud. UNIIM no.9:394-404 '64 (MIRA 18:1)

Tyurin, N. G.

USSR/Physical Chemistry - Electrochemistry. B-12

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3972.

Author : L.N. Antipin, N.G. Tyurin.
Inst :
Title : Causes of Anode Effect Appearance at Electrolytic Aluminum Production.

Orig Pub: Zh. fiz. khimii, 1957, 31, No 5, 1103-1110.

Abstract: The author connects the appearance of the anode effect (AE) with the formation of fluorine compounds in gases of the Al bath basing on the results of polarization voltage measurements on carbon, platimum and iron electrodes. AE appears on previously fluorinated anodes at little current densities and its duration is proportional to that of fluorination. Analyzing the character of polarization curves of fuses with various Al_2O_3 contents, the author arrives at the conclusion that if the Al_2O_3 content was above 0.5%, a non-conducting

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USSR/Physical Chemistry - Electrochemistry. B-12

Abs Jour: Referat. Zhurnal Khimiya, No 2, 1958, 3972.

Author : L.N. Antipin, N.G. Tyurin.
Inst :
Title : Causes of Anode Effect Appearance at Electrolytic Aluminum Production

film containing COF_2 is forming on the anode surface, and if the Al_2O_3 content was under 0.5%, CF_4 is forming. The appearance of this film explains the non-wettability of electrodes by the fuse in the case of AE.

Card : 2/2 -15-

TYURIN N.G.

ANTIPIN, L.N.; VAZHENIN, S.F.; TYURIN, N.G.

Critical current density in electrolyte aluminum bath as dependent on alumina content. Trudy Ural.politekh.inst. no.58:177-179 '57. (MIRA 11:4)
(Alumina) (Aluminum--Electrometallurgy)

TYURIN, N.G.; KHOLMANSKIKH, Yu.B.; KAKOVSKIY, I.A.

Automatic laboratory apparatus for testing the kinetics of hydrometallurgical processes at high temperatures and pressures. Izv.vys.ucheb. zav.; tsvet.met. no.5:69-80 '58. (MIRA 12:1)

1. Ural'skiy politekhnicheskiy institut. Kafedra metallurgii blagorodnykh metallov.
(Laboratories--Apparatus and supplies) (Hydrometallurgy)

AUTHORS: Antipin, L. N., Tyurin, N. G. 76-32-3-22/43

TITLE: The Dependence of the Potential of a Carbon Reference Electrode on the Content of Oxygen in Molten Cryolite (Zavisimost' potentsiala ugol'nogo elektroda sravneniya ot soderzhaniya kisloroda v rasplavlennom kriolite)

PERIODICAL: Zhurnal Fizicheskoy Khimii, 1958, Vol. 32, Nr 3, pp. 640-643 (USSR)

ABSTRACT: It was found by O. A. Yesin, L. K. Gavrilov and B. M. Lepinskikh (reference 1) that the potential of the electrodes mentioned in the title is determined by the content of oxygen absorbed in the coal. Later a formula for the determination of this dependence in cryolite-alumina-electrolytes was set up. In the present work, it was attempted to determine the dependence of the potential of the carbon-electrode from the content of Al_2O_3. From the given experimental method, it follows that in the potential determinations, two methods were employed. According to the first method, a crucible with a diaphragm of molten magnesium was used, where the cell had the arrangement

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C/Na_3AlF_6+ 16% Al_2O_3:Na_3AlF_6 + n%Al_2O_3/C .

The second variety used an arrangement which was used in investigations of the anodic effect. In the performed experiments, a very strong influence of the aluminum dissolved in the electrolyte upon the electrode potential of the carbon-electrode was observed, whereas the character of the curve indicates a complicated interaction of alumina with the molten cryolite. It is found that the above-mentioned formula of calculation, to judge from the experimental results, is not applicable. The resistance measurements in the system C/Na_3AlF + n%Al_2O_3/C showed that at a content of 1% Al_2O_3 a maximum exists, whereas in the interval 2-10% Al_2O_3 no great differences were observed. There are 3 figures and 8 references, 8 of which are Soviet.

The Dependence of the Potential of a Carbon Reference Electrode on the Content of Oxygen in Molten Cryolite 76-32-3-22/43

ASSOCIATION: Politekhnicheskiy institut im. S. M. Kirova, Sverdlovsk (Polytechnic Institute imeni S. M. Kirov, Sverdlovsk)

SUBMITTED: September 28, 1956

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TYURIN, N.G.

Time of gold separation from metal-bearing solutions. Izv. AN SSSR. Ser. geol. 30 no.8:40-44 Ag '65. (MIRA 18:9)

1. Ural'skiy politekhnicheskiy institut imeni Kirova, Sverdlovsk.

TYURIN, N.G.

Composition of hydrothermal solutions. Geol.rud.mestorozh. 5 no.4:24-42 Jl-Ag '63 (MIRA 16:9)

1. Ural'skiy politechnicheskiy institut im. S.M. Kirova, Sverdlovsk.
(Mineralogical chemistry)

TYURIN, N.G.; KHOLMANSKIKH, Yu.B.

Conditions governing the formation of supergene deposits of gold and silver. Izv.vys.ucheb.zav.; geol.i razv 5 no.6:70-78 Je '62. (MIRA 15:7)

1. Ural'skiy politekhnicheskiy institut imeni S.M. Kirova.
(Kazakhstan—Precious metals)

TYURIN, N.G.; KAKOVSKIY, I.A.

Behavior of gold and silver in the oxidation zone of sulfide deposits. Izv.vys.ucheb.zav.; tsvet.met. 3 no.2:6-13 '60. (MIRA 15:4)

1. Ural'skiy politekhnicheskiy institut, kafedra metallurgii blagorodnykh metallov.
(Mining geology) (Precious metals)

TYURIN, N.G.; KAKOVSKIY, I.A.

Special features in the migration of certain metals in the earth's crust. Izv.vys.ucheb.zav.; tsvet.met. 5 no.1:7-14 '62. (MIRA 15:2)

1. Ural'skiy politekhnicheskiy institut, kafedra metallurgii blagorodnykh metallov.

(Mineralogy)

KAKOVSKIY, I.A.; TYURIN, N.G.

Gold behavior in polysulfide solutions at high temperatures and pressures. Izv. vys. ucheb. zav.; tsvet. met. 5 no.2:104-111 '62. (MIRA 15:3)

1. Ural'skiy politekhnicheskiy institut, kafedra metallurgii blagorodnykh metallov.
(Sulfides--Metallurgy) (Gold)

SOV/149-58-5-8/18

AUTHORS: Tyurin, N.G., Kholmanskikh, Yu.B. and Kakovskiy, I.A.

TITLE: An Automatic Laboratory Instrument for Studying the Kinetics of Hydro-metallurgical Processes at High Temperatures and Pressures (Laboratornyy avtomaticheskiy pribor dlya issledovaniya kinetiki gidrometallurgicheskikh protsessov pri vysokikh temperaturakh i davleniyakh)

PERIODICAL: Izvestiya Vysshikh Uchebnykh Zavedeniy, Tsvetnaya Metallurgiya, 1958, Nr 5, pp 69 - 80 + 1 plate (USSR)

ABSTRACT: The autoclave processes play an increasingly important part in the modern hydrometallurgical practice and the field of their application continues to grow. To determine the optimum operating conditions in any particular case, it is necessary to study the kinetics of the autoclave reactions which is not easy owing to the inaccessibility of the system that has to be maintained at high temperatures and under high pressures. The standard method of chemical analysis of periodically taken samples is not suitable for studying reversible reactions, characterised by fast reaction rates or for determining the quantities of the gaseous phases taking

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part in the reactions. In addition, a reverse reaction may take place in the sample during cooling, or the basic reaction may proceed continuously after removal of the sample from the autoclave, in which case the results of the analysis will not be a true indication of the conditions existing in the autoclave at the moment of sampling.
To overcome these difficulties the present authors developed a laboratory instrument which is, basically, a recording polarograph with solid platinum micro-electrodes and in which the autoclave constitutes the electrolysis cell. A photograph of the complete apparatus is shown in Figure 1, while a diagrammatical sketch of the autoclave and the circuit diagram of the polarising unit and the automatic recorder are reproduced in Figure 3. A detailed description of the apparatus and the method of calibration are also given.
The main shortcoming of all polarographs with solid electrodes is that if reproducible results are to be obtained, means have to be found to "clean" the electrode surfaces which easily undergo chemical and/or physical changes.

An Automatic Laboratory Instrument for Studying the Kinetics of Hydro-metallurgical Processes at High Temperatures and Pressures

This is best done by the application of alternating polarisation (Ref 15) and this method has been adopted by the present authors, with the modification that polarisation takes place with the potential changing continuously. To ensure reproducibility of the results, the variation of the electrode potential E must follow a pre-determined law, e.g. $E = E_1 - vt$ where E_1 - potential at the beginning of the cycle, v - rate of the variation of the potential, t - time. With the linear character of the E/t relationship a generator of a simple construction can be used. Under the actual conditions the graph of this relationship constitutes a cyclic curve (see Figure 2). Each cycle consists of two periods: preliminary and working period. During the preliminary period the reduction products formed during the preceding working cycle are removed from the electrode surface. This is attained by superimposing on the electrode so-called initial potential of the sign opposite to the potential of the working period. Polarisation takes place during the

An Automatic Laboratory Instrument for Studying the Kinetics of Hydro-metallurgical Processes at High Temperatures and Pressures

working period with the electrode potential changing from + 0.5 to -3.0 V.

The polarising potential in the form of periodic signals is supplied by a generator. This potential is applied to the cell through a calibrated resistance connected in series. The drop of potential on this resistance which is proportional to the current passing through the cell is fed to the input side of a DC amplifier and the amplified signal actuates the recording mechanism operating on the continuous balancing principle.

In the apparatus described in the present paper, the autoclave itself (250 ml capacity, designed to operate at temperatures up to 300 °C and pressures up to 100 atm and provided with an impeller operating at up to 2 800 rev/min) served as the electrolysis cell. A platinum foil disc 25 mm diameter was used as the anode and a platinum wire 3 mm long, 0.3 mm diameter served as the cathode. This gave the electrode areas ratio of approximately 1/550, which ensured a sufficient degree of stability of the potential of the non-polarisable electrode. The

An Automatic Laboratory Instrument for Studying the Kinetics of Hydro-metallurgical Processes at High Temperatures and Pressures

preliminary experiments designed to check the proper functioning of the cell were carried out at room temperature at atmospheric pressure. Polarograms were obtained for various solutions and from these calibration curves were constructed which confirmed the linear relationship between the wave-height and the cation concentration in the solution. The polarograms for various solutions of $CdCl_2$ in 0.5 N KCl are shown in Figure 4 (the concentration of $CdCl_2$ varying from 0.4 to 3.6 g/l). The calibration curve for this system (graph 1) and also for the system $CuSO_4$/1.0 N NH_4OH (graph 2) are reproduced in Figure 5. In the next stage dissolution of galenite in NaOH solutions in the presence of oxygen was investigated. The polarising cell was calibrated with the aid of the standard plumbite solutions (solutions of PbO in 0.5 N NaOH) at 105, 110, 115, 120 and 125 °C and under total pressure of 7 atm (Figure 6). The calibration curves constructed on the basis of polarograms shown in Figure 6 are reproduced

in Figure 7. These data were used to study the kinetics of the reaction:

$$PbS + 2O_{2(gas)} + 3OH^- = SO_4^{2-} + Pb(OH)_3^-$$

at 115 °C and partial oxygen pressure equal to 5.4 atm. The polarograms of this reaction are shown in Figure 8 and the kinetic curve (concentration of the dissolved galenite versus time) is reproduced in Figure 9. The separate oxygen and lead maxima can be easily distinguished on the polarograms, while the kinetic curve shows that after an induction period (Ref 21) a constant rate of solution is attained. The rate of solution (tangent of the slope of the linear portion of the kinetic curve) was 1.14×10^{-7} g - mol/sec, the rate of the solution constant being 1.1×10^{-8} g-molcm^{-2} sec^{-1} atm$^{-1/2}$. This value is in good agreement with the results obtained by Andersen et al (Ref 21).

Card6/8 The results of the present investigation show that a

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polarograph with platinum electrodes is eminently suitable for analysis of strongly oxidising and reactive media. Application of the initial potential of 0 to +0.5 V ensures the complete regeneration of the surface of the polarisable electrode. The polarograms are characterised by well-defined maxima, and experiments with copper-, cadmium-and lead-bearing solutions have shown that the relationship between the wave-height and the cation concentration is linear, even at elevated temperatures. The temperature coefficient of the wave-height (Figure 7) is 2.4 per 1 °C in the 105 - 125 °C range, i.e. it has diffusion character (Ref 22).
There are 9 figures and 22 references, 10 of which are Soviet and 12 English.

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SOV/149-58-5-8/18

An Automatic Laboratory Instrument for Studying the Kinetics of Hydro-metallurgical Processes at High Temperatures and Pressures

ASSOCIATION: Ural'skiy politekhnicheskiy institut. Kafedra metallurgii blagorodnykh metallov (Ural's Polytechnical Institute. Chair of Metallurgy of Precious Metals)

SUBMITTED: March 5, 1958

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Iyurin, N. G.

TITLE: Conference on Autoclave Processes

PERIODICAL: Tsvetnyye metally, 1959, Nr 7, pp 84-87 (USSR)

ABSTRACT: On 23-26 February 1959 a conference was held in Moscow for summing-up and coordinating work on autoclave processes in the metallurgy of heavy, non-ferrous, rare and noble metals. The conference heard reports as follows: D.M. Yukhtanov, Gintsvetmet, on progress throughout the world on the use of hydrometallurgical, particularly autoclave, methods for non-ferrous and rare metal production; G. N. Dobrokhotov, Gipronikel', on nickel leaching practice at some Soviet works; N. I. Onuchkina and G. N. Dobrokhotov on the thermodynamics and kinetics of the selective reduction by hydrogen and carbon monoxide under pressure of nickel and cobalt from solution; I. Yu. Leshch and K. M. Shelepova, Gipronikel', on design decisions on the application of the flowsheets dealt with by G. N. Dobrokhotov at the Yuzhuralnikel' and Severonikel Combines and the Ufaleyskiy (Ufa) Nickel Works; I. N. Maslenitskiy, Leningradskiy gornyy institut (Leningrad Mining Institute) on the advantages of a combined flotation-autoclave method for nickel-electrolysis of slimes containing platinum-group metals; V. B. Zhilkin, Severonikel' combine, and S. I. Sobol', Gintsvetmet, on the essentials of the neutral method of oxidizing leaching of nickel concentrate from converter-matte flotation; S. I. Sobol' on preliminary investigations on the development of a sulphurous-sulphuric method for leaching nickel and cobalt from oxidized nickel ores; N. N. Maslenitskiy, Mekhanobr, on the main results of investigations of the autoclave-soda process for treating tungsten-ore beneficiation products:

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V. I. Popmukaylo, Mekhanobr, and D. A. Malakhov, Skopinskaya (Skopinsk) TsOF, separately, on problems in the application of an autoclave-soda flowsheet to scheelite and wolframite raw material; G. A. Meyerson, K. Ya. Shapiro, N. N. Khavskiy, R. A. Pavlyuk and A. P. Nadol'skiy, Krasnoyarskiy institut tsvetnykh metallov (Krasnoyarsk Non-Ferrous Metals Institute) on the treatment of tungsten concentrates in hermetical, heated ball-mills with acids or caustic alkalies; V. I. Spiridonova, S. I. Sobol', Ye. I. Gulyayeva, Z. L. Berlin, I. M. Nelen' and B. I. Rudenko, Gintsvetmet, on the treatment of prepared and unprepared sulphide molybdenum raw material by oxidizing autoclave alkaline leaching; I. M. Nelen' and S. I. Sobol' on the kinetics of oxidizing autoclave leaching; A. N. Zelikman and Z. M. Lyapina, Krasnoyarsk Non-Ferrous Metals Institute, on the results of a study of conditions for the selective separation of lower oxides of tungsten and molybdenum from their salt solutions by hydrogen under pressure; M. V. Darbinyan, Gorno-

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metallurgicheskiy institut (Mining-Metallurgical Institute) of the Sovnarkhoz (economic council) of the Armyanskaya SSR (Armenian SSR), on his investigations of ammoniacal autoclave leaching under oxygen pressure of molybdenum concentrates; S. I. Sobol' on technical-economic factors of ammoniacal leaching; A. I. Sinel'nikova and I. N. Plaksin, Krasnoyarsk Non-Ferrous Metals Institute, on an oxidizing autoclave process for gold-containing raw material; N. G. Tyurin, Ural'skiy politekhnicheskiy institut (Ural Polytechnic Institute) on the behaviour of noble metals in oxidizing autoclave leaching in thiosulphate solutions; A. L. Tseft and D. A. Taraskin and A. Yu. Daibayev, Institut metallurgii i obogashcheniya AN Kaz SSR (Metallurgy and Beneficiation Institute of the AS Kaz SSR), respectively, on the physicochemical fundamentals and on works' trials of autoclave salt leaching of polymetallic materials; I. Yu. Leshch, Gipronikel', on the unsuitability of autoclave leaching for lime-containing materials; V. A. Bernshteyn, VAMI, on industrial experience of a continuous autoclave leaching process for bauxites; V. G. Tronev, IONKh AN

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SSSR (IONKh AS USSR), on compounds of some rare elements in various valency states under oxygen and hydrogen pressure in the presence of anhydrous ammonia; Z. L. Berlin, Gintsvetmet, on autoclave design and operation; P. G. Yakovlev, Gipronikel', and N. Ye. Vishnevskiy, VNII neftekhim, on model studies on autoclaves and the development of mixers; M. A. Polyanov, K. B. Giredmet, on the design of an experimental high-pressure pulp pump. G. L. Shvarts, NIIKhIMMASh, on the selection of steel for acid leaching of cobalt matte and matte-flotation concentrate; Yu. I. Archakov, VNIIneftekhim, on corrosion of types 1Kh18N9T, 12KhGN, 10KhSND and 10GND steels in soda and alkaline solutions in the presence of metal salts and oxygen at 5 - 15 kg/mm²; V. I. Deryabina and N. N. Kalgatin, VNIIneftekhim, separately on mechanical properties of hydrogen-affected steels. The conference made recommendations aimed at the extension and improve-

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BURDUN, G.D., doktor tekhn.nauk, prof.; TYURIN, N.I., inzh.

SI, a new international unit system. Nauka i zhizn' 29 no.5:20-27 My '62. (MIRA 15:11)

1. Chlen Mezhdunarodnogo komiteta mer i vesov (for Burdun).
2. Rukovoditel' laboratorii Vsesoyuznogo nauchno-issledovatel'skogo instituta Komiteta standartov, mer i izmeritel'nykh priborov (for Tyurin).

(Units)

TYURIN, N.I.

A double potentiometer instrument for testing wattmeters. Izm. tekh. no.3:49-52 My-Je '55. (MLRA 8:9)
(Potentiometer) (Wattmeter)

TYURIN, N. I.

USSR/General Section - Metrology. Laboratory Technique. A-6

Abs Jour : Ref Zhur - Fizika, No 4, 1957, 8367

Author : N.I. Tyurin
Inst :
Title : All-Union Industrial Exhibition of 1956. Exhibit of Standards, and Precision Measurements.

Orig Pub : Izmer. tekhnika, 1956, No 4, 3-16

Abstract : A brief description of the exhibits in room No 5, of the "Machine Building" pavillion. These include (a) schemes for maintaining unity of measurement, attained accuracy, and measurement limits; (b) models of standards; (c) latest models of instruments and setups for various fields of measurements developed by the institutes of the Committee of Standards, Measures, and Measuring Instruments.

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TYURIN, M.I.

Control in the operations of testing laboratories. Izm.tekh. no.6:66-69 N-D '56. (MIRA 10:1)
(Testing laboratories)

BYKOV, M.A.; TYURIN, N.I.

Conference on electric insturment desigh. Izm.tekh.no.6:97 N-D '56. (MLRA 10:1)

(Kiev--Electric instruments--Congresses)

105-6-6/26

AUTHOR LEVIN, M. I., Doctor of Technical Sciences, Professor; BYKOV, M. A., Candidate of Technical Sciences; TYURIN, N. I., Engineer.

TITLE Problems connected with the Standardization of Electric Measuring Devices. (Voprosy standartizatsii elektroizmeritel'nykh priborov.-Russian)

PERIODICAL Elektrichestvo 1957, Nr 6, pp 21-24 (U.S.S.R.)

ABSTRACT The technical committee Nr 13 of the International Electro-technical Commission (IEC) recently worked out "recommendations" for acting energy counters and indicators. In November 1955 they were discussed at Budapest, but in view of the fact that a number of points were considered to be unacceptable by the Soviet delegation, the "recommendations" of the conference were left to be dealt with by the technical experts who met in London in January 1956. In October 1956 two projects of the "recommendations" for electric acting energy counters of the class 2,0 and for electric measuring and indicating devices were completed in London and in Naples. At present the definite texts are being worked out by the Hungarian National Committee and will enter into force after being approved by the member states. Some of the resolutions were made in form of compromises as e.g. those concerning the binding force of standards, terms of guarantee, etc. In the course of a short survey it is shown

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 Problems connected with the Standardization of Electric Measuring Devices. 105-6-6/26

to what extent these resolutions agree with or diverge from the present Soviet GOST standards. The next program of the Technical Committee Nr 3 will comprise the working out of recommendations concerning blind energy counters, recording and contact devices, as well as the beginning of work concerning standards for measuring transformers, already going on since 1930. A survey is given of the work carried out within the past 25 years. In July 1956 the project of "recommendations" for measuring transformers was worked out by the Committee Nr 38 formed especially for this purpose at Munich. It comprises three groups of "recommendations":
1) Measuring transformers.
2) Protective transformers.
3) Condenser-voltage transformers.
This recommendation is compared with present Soviet standards.
(With 4 Slavic references)

ASSOCIATION: VNII of the Committee for Standards, Measures, and Measuring Devices.

PRESENTED BY: -
SUBMITTED: 10.4. 1957
AVAILABLE: Library of Congress.

TYURIN, N.I.; ARAPOV, P.P., red.

[Standardization, metrology, standard measures and precision measurement] Standartizatsiia, metrologiia, etalony i tochnye izmereniia. Moskva, Kom-t standartov, mer i izmeritel'nykh priborov pri Sovete Ministrov SSSR. 1958. 66 p.
(MIRA 14:1)

1. Moscow. Vsesoyuznaya promyshlennaya vystavka. Pavil'on "Mashinostroyeniye."
(Standardization) (Mensuration)

PHASE I BOOK EXPLOITATION SOV/4697

Tyurin, Nikolay Ivanovich

V poiskakh tochnosti (In Search of Precision) 2d ed., rev. and enl. Moscow, Fizmatgiz, 1960. 246 p. 15,000 copies printed.

Ed.: V. I. Rydnik; Tech. Ed.: K. F. Brudno.

PURPOSE: The book is intended for workers concerned with problems in precision measurement. It may also be used by teachers and students of secondary schools and tekhnikums.

COVERAGE: This book deals with problems of precision measurement in science and industry. The author discusses in popular form general problems of the theory and techniques of measurements, the causes of errors, the relationship between the sensitivity of the measuring instruments and the precision of the measurements, the role of standards, and the systems of units used in science and industry. The author thanks B. V. Blinov, S. V. Gorbatsevich, I.N. Krotkov, N. N. Shishkin, and N. A. Peliks. There are no references.

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MALIKOV, Sergey Fedoseyevich; TYURIN, Nikolay Ivanovich;
DOLINSKIY, Ye.F., retsenzent; SHIROKOV, K.P., dokt.tekhn.
nauk, red.
[Introduction to metrology] Vvedenie v metrologiiu.
Moskva, Izd-vo standartov, 1965. 239 p. (MIRA 18:4)

TYURIN, N. I., Engineer

"An Innovation in the Process of Tipping Cutting Tools,"

Stanki I Instrument, 10, No. 12, 1939.

Report U-1505, 4 Oct 1951

KRASNOPOL'SKIY, David Zakharovich; TYURIN, N.I., red.; SUKHAREVA, R.A., tekhn.red.

[Progressive thread-rolling machines] Progressivnyi instrument dlia nakatyvaniia rez'by. Moskva, 1958. 27 p. (Peredovoi opyt proizvodstva. Seriia "Tekhnologiia mashinostroeniia," no.6) (Screw-cutting machines) (MIRA 12:5)

ZALESSKIY, V.I., prof; TYURIN, N.I., inzh.

Speed of metal filling of cylindrical cavities in closed die stamps. Izv. vys. ucheb. zav.; chern. met. no.12:69-72 D '58. (MIRA 12:3)

1.Moskovskiy institut stali.
(Forging) (Dies (Metalworking))

TYURIN, N. I.: Master Tech Sci (diss) -- "Investigation of the process of pressing in closed presses". Moscow, 1959. 14 pp (Min Higher Educ USSR, Moscow Order of Labor Red Banner Inst of Steel im I. V. Stalin), 120 copies (KL, No 18, 1959, 125)

NIKOLAYEV, Viktor Vasil'yevich; SOROKIN, Boris Vasil'yevich; TYURIN, M.I., red.; YUSTUS, R.R., otv. za vypusk; SUKHAREVA, R.A., tekhn.red.

[Design of grooved rolls; experience of the Likhachev Automobile Plant] Proektirovanie profilirovochnykh rolikov; opyt avtozavoda im. I.A.Likhacheva. Moskva, 1959. 42 p. (Moskovskii dom nauchno-tekhnicheskoi propagandy. Peredovoi opyt proizvodstva. Seriia: Progressivnaia tekhnologiia mashinostroeniia, vyp. 10). (Rolls (Iron mills)) (MIRA 13:10)

ZALESSKIY, V.I.; TYURIN, N.I.

Investigating the closed-die forging process. Kuz.-shtam.proizv. 1 no.1:4-8 Ja '59. (MIRA 12:10)
(Forging) (Dies (Metalworking))

18 (7)

AUTHORS: Zalesskiy, V. I., Tyurin, N. I. SOV/163-59-2-28/48

TITLE: The Experimental Determination of Contact Stresses Along the Height of the Press Die in Finless Pressing (Eksperimental'noye opredeleniye kontaktnykh napryazheniy po vysote shtampa pri bezobloynoy shtampovke)

PERIODICAL: Nauchnyye doklady vysshey shkoly. Metallurgiya, 1959, Nr 2, pp 158-164 (USSR)

ABSTRACT: For determining the normal stresses, a measuring ring 5 mm high was placed into a hydraulic 50-ton press; the tangential stress of the ring caused by linear expansion was transmitted to a pressure cell, and recorded over an electron amplifier by a loop oscillograph. The measuring ring was placed around the pressing room at different heights so that the change of the normal stress along the course of the press die could be recorded. Lead was used as pressing material the structure of which was homogenized by a special treatment. Figure 1 shows the experimental arrangement. Figure 2 shows the dimensions of two stampings. Figure 3 shows the course of the pressure curve in gradual filling of the die mold with the metal. Figure 4 shows the points of measurement and the

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distribution of normal stresses along the height of the press die. It shows that the maximum stress is shifted slightly downward to the fixed counterpunch. Therefore it is recommended: 1) If there is a compensator in the form of a transverse fissure of constant height, it should be attached to the bottom of the lower hollow of the press die. 2) The height of the lower hollow should be as low as possible. Figure 5 shows the stress distribution along the press die in a three-dimensional diagram (coordinates: stress, degree of deformation, measuring point along the course of the press die). There are 5 figures and 6 Soviet references.

ASSOCIATION: Moskovskiy institut stali (Moscow Steel Institute)

SUBMITTED: October 22, 1958

TYURIN, N.I.; SHARAPOV, B.Ya.

Training students in teachers' colleges for the introduction of vocational education in schools. Politekh.obuch. no.12:69-73 D '58. (MIRA 11:12)

1. Iz opyta raboty fiziko-matematicheskogo fakul'teta Arzamasskogo pedagogicheskogo instituta.
(Arzamas--Teachers, Training of)

TYURIN, N.I.

Studying chemistry in the institutions of higher learning and secondary schools. Khim. v shkole 17 no.3:32-35 My-Je '62.
(MIRA 15:6)

1. Pedagogicheskiy institut, g. Orekhovo-Zuyevo.
(Chemistry--Study and teaching)

SHURAKOV, M.M.; TYURIN, N.N.

Stamping panels of magnesium alloys. Av.prom. 26 no.8:94-95 Ag '57. (MIRA 15:4)
(Forging)

ZEMEL'MAN, M.A.; TYURIN, N.I.

Using official testing of measuring instruments for the evaluation of their reliability and suitability for serial production. Izm.tekh. no.12:7-8 D '61. (MIRA 15:1)

(Measuring instruments--Testing)

KARELIN, N.M.; TYURIN, N.I.

New stage in the governmental inspection of measuring instruments. Izm.tekh. no.9:1-5 S '61. (MIRA 14:8)
(Measuring instruments—Testing)

TYURIN, N.I.; LYUBARSKAYA, A.M.; BOGUSLAVSKIY, V.P.

Universal amvoltohmmeters. Izm.tekh. no.10:44-46 O '61.
(MIRA 14:11)

(Electric meters)

TYUKHTIN, N.S.; MIKHAYLOV, V.N. (Amurskaya obl[illegible])

Differential diagnosis of paragonimiasis and pulmonary tuberculosis. Probl. tuberk. 41 no.4:73-76 '63 (MIRA 17:2)

33127
S/115/61/000/012/001/005
E198/E455

13,2940

AUTHORS: Zemel'man, M.A., Tyurin, N.I.

TITLE: The evaluation of reliability and suitability for serial production of instruments in the national research

PERIODICAL: Izmeritel'naya tekhnika, no.12, 1961, 7-8

TEXT: Both the methods and the theory of checking the reliability and fitness for serial production of prototype measuring instruments are still incomplete. The difficulties are increased by the fact that, as a rule, only a few models, sometimes only one, are checked. Nevertheless, an approach permitting improvement in such checking is proposed. In order to ensure that the necessary technical characteristics are preserved in serial production, the design of the instrument must satisfy at least the two following conditions: 1) that all parts and components supplied as intermediate products are used strictly under prescribed conditions and 2) that the instruments retain the required characteristics when their parts and components, or at least the essential ones, all have the limiting (i.e. the "worst") admissible parameters. In addition if the instrument contains a negative feedback circuit, this may

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The evaluation of reliability ...

considerably influence the readings and hamper the detection of undesirable characteristics in the components. It is therefore essential that in such instruments the tests in question are carried out with the negative feedback circuit open and the necessary adjustments are made subsequently by computation. This is specially important when only one, or a small number of test models, is available for checking purposes.

Card 2/2

TYURIN, N.I.; BARINOV, V.A., prof., red.; MALIKOV, S.F., otv. red.

[Centennial of the State Service of Weights and Measures, 1845-1945] Sto let gosudarstvennoi sluzhby mer i vesov, 1845-1945. Moskva, 1945. 22 p. (MIRA 14:7)

1. Russia (1923- U.S.S.R.) Komitet standartov, mer i izmeritel'nykh priborov.
(Weights and measures)

TYURIN, N.I.; LYUBARSKAYA, A.M.; BOGUSLAVSKIY, V.P.

Universal avometers. Izm.tekh. no.12:27-30 D '60.(MIRA 13:11)
(Electric meters)

TYURIN, N.I.

"In search of precision" by N.I.Tiurin. Nauka i zhizn' 27 no.12: 76 D '60. (MIRA 13:12)

(Physical measurements)

TYURIN, N.I., red.; KUZNETSOVA, M.I., red. izd-va; KONDRAT'YEVA, M.A., tekhn. red.

[Instructions 187-54 for checking galvanometers] Instruktsiia 187-54 po poverke gal'vanometrov. Izd. ofitsial'noe. Moskva, 1957. 18 p. (MIRA 14:5)

1. Russia (1923- U.S.S.R.) Komitet standartov, mer i izmeritel'nykh priborov.
(Galvanometer--Testing)

TYURIN, N.I., red.; KUZNETSOVA, M.A., red. izd-va; KONDRAT'YEVA, M.A., tekhn. red.

[Instructions 188-54 for checking ohmmeters, megohmmeters, and faradmeters] Instruktsiia 188-54 po poverke ommetrov, megommetrov i faradmetrov. Izd. ofitsial'noe. Moskva, 1957. 22 p. (MIRA 14:5)

1. Russia (1923- U.S.S.R.) Komitet standartov, mer i izmeritel'nykh priborov.
(Ohmmeter--Testing) (Electric capacitors--Testing)

TYURIN, M.I., red.

[Instructions 179-55 on checking inductance coils, mutual inductance coils, and inductance boxes] Instruktsiia 179-55 po poverke katushek induktivnosti, vzaimnoi induktivnosti i magazinov induktivnosti. Izd. ofitsial'noe. Moskva, 1957. (MIRA 14:5)

1. Russia(1923- U.S.S.R.) Komitet standartov, mer i izmeritel'nykh priborov.
(Electric coils--Testing)

TYURIN, N.I., red.

[Instructions 176-55 for checking standard cells] Instruktsiia 176-55 po poverke normal'nykh elementov. Izd. ofitsial'noe. Moskva, 1957. 27 p. (MIRA 14:5)

1. Russia (1923- U.S.S.R.) Komitet standartov, mer i izmeritel'nykh priborov.
(Standard cells--Testing)

TYURIN, N.I., red.

[Instructions 190-56 for checking a.c. potentiometers] Instruktsiia 190-56 po poverke potentsiometrov peremennogo toka. Izd. ofitsial'noe. Moskva, 1957. 28 p. (MIRA 14:5)

1. Russia (1923- U.S.S.R.) Komitet standartov, mer i izmeritel'nykh priborov.
(Potentiometers--Testing)

TYURIN, N.I., otv. red.

[Instructions 193-55 for checking instrument transformers] Instructions 193-55 po poverke izmeritel'nykh transformatorov. Izd. ofitsial'noe. Moskva, 1957. 31 p. (MIRA 14:5)

1. Russia (1923- U.S.S.R.) Komitet standartov, mer i izmeritel'nykh priborov.
(Electric transformers--Testing)

TYURIN, N.I., red.; KUZNETSOVA, M.I., red. izd-va; KONDRAT'YEVA, M.A., tekhn. red.

[Instructions 182-55 for checking resistance boxes] Instruktsiia 182-55 po poverke izmeritel'nykh magazinov soprotivleniia. Izd. ofitsial'noe. Moskva, 1957. 36 p. (MIRA 14:5)

1. Russia (1923- U.S.S.R.) Komitet standartov, mer i izmeritel'nykh priborov.
(Electric resistance)
(Electric engineering--Equipment and supplies)

TYURIN, N. L.

Edinitsy izmerenii priniatye v SSSR; nauchno-populiarnyi ocherk, pod. red. I.F.Lisachenko. Moskva, 1947. 81 p.

At head of title: Komitet po delam mer i izmeritel'nykh priborov.

Units of weight and measures accepted in the USSR; a popularized scientific essay.

DLC: QC89.A9T58

SO: Manufacturing and Mechanical Engineering in the Soviet Union, Library of Congress, 1953.

NOVOBRATSKIY, R.L.; SEREDIN, P.I.; TYURIN, N.N.

Manufacture of forged titanium alloy rods with improved mechanical properties. Kuz.-shtam. proizv. 3 no.11:12-15 N '61. (MIRA 14:11)

(Titanium alloys) (Forging)

FRIDLYANDER, I.N.; ROMANOVA, O.A.; ARCHAKOVA, Z.N.; GUR'YEV, I.I.; DRONOVA, N.P.; PETROVA, A.A.; BYCHKOVA, Z.S.; Prinimali uchastiye: FOMIN, K.N.; LEBEDEVA, N.S.; REZNIK, P.G.; AVERKINA, N.; ZHELTOVSKAYA, L.S.; VOROB'YEV, Yu.A.; TYURIN, N.N.

Manufacture and investigation of semifinished products from high-strength and heat-resistant VAD23 aluminum alloys. Alium. splavy no.3:194-200 '64. (MIRA 17:6)

S/182/61/000/011/002/005
D038/D113

AUTHORS: Novobratskiy, R. L., Seredin, P. I. and Tyurin, N. N.

TITLE: Production of forged rods with improved mechanical properties from titanium alloys

PERIODICAL: Kuznechno-shtampovochnoye proizvodstvo, no. 11, 1961, 12-15

TEXT: The effect of the deformation stage on the mechanical properties of forged rods was studied. The rods were extruded from BT5 (VT5) and BT 3-1 (VT3-1) titanium alloys listed in Table 1. Forgings were cast in vacuum arc furnaces in 2 meltings, and heated in a fuel oil furnace with a mild oxidizing atmosphere. VT5 titanium alloy specimens were annealed at 750 ± 10°C, aged for 2 hours, and cooled in air. VT3-1 titanium alloy specimens were homogenized at 870 ± 10°C, aged for 2 hours, cooled to 650°C in a furnace, aged for 1 hour at 650°C, and cooled in air. It is stated that the degree of deformation for the VT5 titanium alloy was zero at 1020°C and for the VT3-1 titanium alloy zero at 1030°C. The annealed and un-annealed specimens underwent tensile and impact tests. The authors conclude that (1) by increasing the degree of deformation after the last heating, the plasticity

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and strength of the forged rods can be raised with a corresponding structural change in the metal; (2) to bring the mechanical properties of the rods to the suitable TY (TU) specifications by forging, the following degree of deformation should be used after the last heating - 60-70% for the VT5 titanium alloy, and 50-60% for the VT3-1 titanium alloy; (3) the new forging process improved the metal quality, and reduces rejects. N. N. Averkina and A. A. Petrova took part in the laboratory tests. There are 6 figures, 3 tables and 2 Soviet-bloc references.

Table 1. VT5 and VT3-1 Titanium alloys

Alloy	Ti	Al	Cr	Mo	Fe	Si	C	N	H
VT5	Base	5.23	-	-	0.11	0.05	0.047	0.011	0.006
VT3-1	Base	6.16	2.17	2.61	0.58	0.06	0.040	0.031	0.006

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TYURIN, N.V.

Role of soil science in the development of Soviet agriculture.
Pochvovedenie no.1:3-11 Ja '61. (MIRA 14:1)

1. Pochvennyy institut imeni V.V. Dokuchayeva AN SSSR.
(Soil research)

CHERNYSHEV, V.G.; TYURIN, N.Ye.

Electric equipment of the DT-75 tractor. Trakt. i sel'khozmash. no.2:44-46 F '64. (MIRA 17:3)

1. Volgogradskiy traktornyy zavod.

BEN', I., inzh.; BEREZHKOVSKAYA, M., inzh.; KOZLOVA, O., inzh.; TYURIN, P., inzh.

Potentialities for the production and use of window glass. Zhil. stroi. no.2:20-21 '59. (MIRA 12:6)
(Glass)

MATVEYEV, A., YERMOLAYEV, I., TYURIN, P.

Bee Culture

Anti-scientific book on bee culture ("My method of working with bees." F. P. Pakshin. Reviewed by A. Matveyev, I. Yermolayev, P. Tyurin Pchelovodstvo 29, No. 9, 1952.

9. Monthly List of Russian Accessions, Library of Congress, November 1952 1953, Uncl.

MEYKLYAR, Mikhail Vladimirovich; VUKALOVICH, M.P., red.; KIRILLIN, V.A., red.; KOMAROV, L.P., red.; TYURIN, P.Ya., red.; TROYANSKIY, Ye.A., red.; BORUNOV, N.I., tekhn. red.

[Engineering performance of the metal of a steam boiler] Kak rabotaet metall parovogo kotla. Moskva, Gos. energ. izd-vo, 1961. 93 p. (Biblioteka teplotekhnika, no.8) (MIRA 14:8)
(Boilers) (Metals)

AUTHOR: Tyurin, P.Ya., Engineer SOV/96-59-5-2/19

TITLE: Some Fundamental Problems in the Development of Thermal Electric Power Stations (Nekotoryye printsipial'nyye voprosy razvitiya teplovykh elektrostantsiy)

PERIODICAL: Teploenergetika, 1959, Nr 5, pp 8-16 (USSR)

ABSTRACT: This article reviews the economic effect of raising the initial steam conditions in thermal power stations, taking into account the unit output of the sets and the location of the stations in relation to the source of fuel. A method of deciding the amount of power reserves in a system is considered. In studying the economic effect of increasing initial steam conditions, it is usual to compare the increased cost of the installation and the reduction in specific fuel consumption. In fact, the increase in initial steam conditions is mainly governed by the rate of progress in power engineering and particularly by the amount of electric power generated and the load density in the area served. Initial steam conditions are closely related to unit size of set. For a

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given output of set, increasing the initial steam conditions increases the cost of the high-pressure part of the turbine, of the boiler heating-surfaces and of the high-pressure pipework, whilst it cheapens the exhaust part of the turbine. There is also a decrease in the thermal output required of the boiler per unit output of turbine and the auxiliary equipment costs relatively less. Thus from the standpoint of cost per installed kilowatt for any given steam conditions, the size of set should be increased only up to a certain limit. Beyond this point, the use of the next highest set of steam conditions would not increase the cost per installed kilowatt. Thus for steam conditions of 90 atm and 535°C, unit sizes up to 50 MW are suitable; further increase in output up to 100 MW is not justified until the next set of steam conditions is used, namely 130 atm at 565/565°C. The position is illustrated by the data given in Table 1 for the cost per installed kilowatt of various sizes of set with different steam conditions. The data in the Table was calculated by the Teploelektroproyekt Institute.

Some Fundamental Problems in the Development of Thermal Electric Power Stations

The higher the technical standard of power engineering, the smaller will be the minimum rating of a unit for which a given set of (higher) steam conditions can be used. For example, until quite recently no unit output smaller then 100 MW was considered, for steam conditions of 90 atm and 500°C but this has since been reduced to 50 MW. New higher steam conditions are introduced when installing sets of such a unit output that the cost per installed kilowatt is not much changed. Thus the use of higher steam conditions is governed mainly by increasing the individual output of sets, which in turn is largely dependent on the amount of electric power required and the load density. From this point of view, it is sometimes advisable to use higher steam conditions in a district where fuel is expensive but it is never advisable to reduce the steam conditions for a given size of set in a district with cheap fuel. Fuel cost mainly influences the value of exhaust losses in turbines and flue gas losses. The magnitude of such losses should be determined by comparing

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the fuel economy with the increase in capital cost. An analysis is then given of the figures of Table 1, deducing the size and the type of set that should be installed in different sorts of power stations. For example, it is shown that for the sizes of power station considered, there is no point in using steam conditions of 300 atm and 650/565°C. Recommendations are made about the best unit output of sets for each set of steam conditions. The amount of reserve plant that should be available in a power system is then considered. The reserve power plant factor is discussed in relation both to the winter peak and to the annual production of electric power. In deciding the reserve required to cover the winter peak, allowance must be made for current maintenance and faults. Major overhauls are usually made in the summer season. For a number of years, the capacity discounted by the shut-down of boilers for current overhaul has been fairly steady at about 4.2% of the installed boiler output. In relation to the winter peak the proportion is about 5%.

 For large power systems the average reserve against

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current repair may be selected on the basis of the mean figure but it obviously cannot be less than the largest set in the system. The reserve to cover emergency faults should be based not on average outages but upon the largest set in the system. It will be seen that as the unit size of set is increased the capital cost per kilowatt of the new capacity is reduced but the amount of spare capacity required is increased. Formulae are derived to show the actual cost-reduction achieved by using larger sets. If the most economic size of set is decided by assuming one set out of commission for emergency repair, then the largest set should not carry more than 4% of the system output. On the basis of two sets out of commission at once, this figure would only be 2.7% of the system power. If reserves are based on having more than one set out at once on fault, the unit size of set becomes too small. If some decrease in the reliability of supply can be tolerated, it is best to

 rate the largest set for up to 8 to 10% of the system

power. It is concluded that the total power reserve in a system in order to cover the winter peak should be 15 to 16%, of which 5% is for current maintenance and 5% for emergency outage of the largest set; a further 5 to 6% is for possible differences between the actual and supposed values of the winter peak for delays in introducing new plant and for loss of plant output due to operational causes. In determining the reserve power required in systems to cover the winter peak, the output of hydro-stations should be based on the installed capacity and not on the main annual load in a dry year. Normally hydro-stations should be capable of operating at full output during the winter peak. The relationship is then considered between the annual number of hours of utilisation of the installed capacity and the amount of reserve plant. From formulae which are derived it is concluded that the former does not uniquely govern the reserve output in the system, which also depends on the number of hours of utilisation of peak load. It is shown that unless care is taken there may be too much reserve

Some Fundamental Problems in the Development of Thermal Electric Power Stations

plant in systems containing a high proportion of hydro-electric output. In practice the number of hours of utilisation of installed capacity of thermal power stations operating in power systems is about 6500 hours. The load factor of the turbine ranges from 0.8 to 0.9, depending on the nature of the load curve, and the average number of hours it is in operation is about 8200; the figure for boilers is 8000 hours. These factors are used to justify an actual choice of reserve capacity of 22% in a particular case. On comparing stations having cross-connections between sets on the steam side with those having the boiler-turbine unit arrangement, it is found that the capital cost per installed kilowatt for a station with two boilers per turbine and a reserve boiler is about 15% greater than with the unit arrangement. Of this, 5% is the cost of the reserve boiler, 4 to 5% the increased cost of two boilers per turbine as compared with one, and 4 to 5% the cost of the cross-connections. Further consideration of the economics of this question concerns

the capital cost of providing reserve capacity. That provided in the power system costs about half that within the station. The former is also preferable because it makes operation of the system and station much more cheap and reliable. The use of cross-connections on the steam side and reserve boilers is only justified when the power station operates in a small system where small sets would be necessary to provide the reserve output. At present, there are power systems of 6000 to 7000 MW. It is likely that in 1965, the capacity of the largest power systems will be 10000 to 12000 MW. If it is accepted that the largest set may account for 4% of the system output, it is at present possible and advisable to instal in large systems units of 200 MW; and towards the middle of the 7-year plan it will be feasible to make extensive use of sets of 300 and 400 MW. By about 1972, sets of 600 to 700 MW will become practicable. It is concluded from this that during the current 7-year plan it will be best to use steam conditions of 130 atm and 565/565°C, also 240 atm and 580/565°C. In the period 1965 to 1972 extensive use will

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be made of the latter conditions and possibly towards the end of this period, 300 atm and 650/565/565°C. It will also be necessary to construct individual installations for steam conditions and unit outputs considerably higher than those that are economically justified for the given period of time. In this way the necessary technical experience should be gained by the time such sets are required on a large scale. From this point of view during the period 1959-65 it will be necessary to construct individual installations with steam conditions of 300 atm and 650/565/565°C. It will also be advisable to solve some problems associated with the use of steam conditions of 400 to 800 atm and 700°C. The location of power stations relative to the fuel sources is then considered. In considering this question it is usual to compare the cost of transporting coal and the cost of transmitting electricity over a power line. This would be valid if the comparison was based on transmission lines of the