PATROVSKY, V.

3563 Use of complexones in chemical analysis. III. Detection of boron, germanium, niobium and tantalum with catechol violet. V. Patrovsky (Czech. Geolog. Inst., Prague, Czechoslovakia). *Chem. Listy*, 1957, 51 (5), 868-869.—In neutral soln. (pH 6 to 7), catechol violet (I) yields coloured complexes with Ge, B, Nb and Ta. The interference of many other elements can be avoided by the addition of EDTA (disodium salt) (II) and ammonium oxalate. *Procedure*: To a slightly acid soln. of the sample add an excess of a mixture of 0·1 *M* II and a satd. soln. of ammonium oxalate (1:1), and, after addition of Na acetate, one to three drops of I soln. (0·1%). A reddish (B), purple (Ge), or blue-violet (Nb, Ta) colour appears. J. ZÝKA

PATROVSKY, Venceslav

CZECHOSLOVAKIA/Analytic Chemistry - Analysis of Inorganic Substances. E-2

Abs Jour : Ref Zhur - Khimiya, No 10, 1958, 32160

Author : Venceslav Patrovsky
Inst : -
Title : Application of Complexones to Chemical Analysis, LII. Detection of Boron, Germanium, Niobium and Tantalum with Pyrocatechin Violet.

Orig Pub : Chem. listy, 1957, 51, No 5, 963-969

Abstract : It was found that in a neutral or very weakly acid medium (pH = 6 to 7), pyrocatechin violet produces changes to light red with B, to purple-violet with Ge and to blue-violet with Nb and Ta. These color reactions can be used for the detection of the above mentioned elements. The interfering influence of Sn(4+), W, Ti, As, Se and other elements is eliminated by adding 0.1 M of complexone III solution and saturated $(NH_4)_2C_2O_4$

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PATROVSKY, V.

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812. New method of separating and determining rhenium. V. Patrovský (Cent. Geolog. Inst., Prague, Czechoslovakia). *Chem. Listy*, 1957, 51 (7), 1295-1299. A method for the separation of Re from various [illegible] Mo and optimal conditions [illegible] method [illegible] molybdenite. [illegible] the sample (1 to 2 g) in [illegible]

[illegible]

make slightly alkaline with aq. NH_3. Add Zn soln. [illegible] and pass H_2S. Filter off the ppt., wash it with NH_3 [illegible], then dissolve it in HCl (2 to 6 ml) with the addition of a few drops of H_2O_2, the excess being removed by boiling. Add $FeCl_3$ soln. (5%) (1 ml), conc. HCl (5 ml) and [illegible] to between 50 and 60 ml and extract with ether (2 × 20 ml) [illegible] remains coloured. Add $SnCl_2$ soln. [illegible] becomes colourless, then [illegible]

[illegible] ether, mix, and [illegible] As little as 10^{-4} % of Re can be determined in a 1 to 2-g sample. When determining Re in manganese [illegible] the undissolved [illegible] can be separated by reduction with [illegible]

PATROVSKY, V.

2503. Complexometric titrations (chelatometry). XXII. The volumetric determination of Fe, aluminium and titanium in silicates. Notes on the oxalatometric determination of calcium and magnesium. V. Patrovský and M. Hájek (Geofit. Geofiz. Inst., Prague). *Coll. Czech. Chem. Commun.*, 1957, 22 (1), 37–43 (in German).—Dissolve 0·5 to 1 g of sample in HCl, add 1 ml of HNO_3 to oxidise Fe, evaporate to dryness and filter off SiO_2 after extraction of the residue. Neutralise the filtrate with aq. NH_3 to the appearance of the brown cloudiness or colour of basic Fe^{III} salts, and clear the soln. with HCl (one drop). Add hexamine soln. (10%) (10 ml) and warm to between 80° and 90°. Filter off the hydroxides of Fe, Al and Ti, wash them with a 0·5% soln. of the precipitant, then dissolve in the min. quantity of warm HCl (1:1) or H_2SO_4 (1:3). The hydroxides do not dissolve easily in H_2SO_4, but Ti can be directly determined in such soln. colorimetrically with H_2O_2. Make the soln. up to 100 ml. Use 50- or 25-ml aliquots for the determination, and the remainder for determining Ti and for control determinations. Dilute the soln. and determine Fe by titration with 0·1 *M* EDTA (disodium salt) (1), with sulphosalicylic acid at pH 2 to 3 at 40° to 50°, to a dark-blue colour. With a low content of Fe, it is recommended to work in a small volume and to add more sulphosalicylic acid towards the end-point. After the titration of Fe, add a moderate excess of Fe soln., adjust the pH to ≈ 4·5 by adding

PATROVSKY, V. - HUKA

a small excess of Na acetate and
5 to 10 min. Add a few
violet soln. If the soln
I soln to a
and with
dropwise
excess of I soln
The amount of I equivalent
obtained. The
an aliquot of the soln.
Mn, Co, Ni, Zn, Pb and Cu; VV causes no marked
interference, and VII has a slight effect, which is
negligible from small quantities. Borate, phos-
phate, Ca and Mg do not interfere. The Fe, Al and
Ti may be separated from Mn with hexamine-
pyridine or Na acetate. The filtrate may then be
used for the determination of Mn, Ca and Mg.
Determines Mg colorimetrically with formaldoxime
(up to 0-2 mg in 50 ml). If Ca is to be determined
Mn must be removed by adding 5% diethyldithio-
carbamate soln. Extract the brown-red Cu, in the
presence of Cu, yellow) cloudiness or ppt with
$CHCl_3$, and after evaporation of the solvent and
solution of the residue in HCl
complexometrically with catechol violet soln. or
Eriochrome black T as indicator. The Cu is held
with cyanide. If the ammonium content is not too
high, determines Ca with I soln. against murexide;
the pH must be at least 11. The ammonium
content should be as low as possible. Remove Mn
from the soln. with dithiocarbamate, or complex it
with triethanolamine. Titration with I soln. in the

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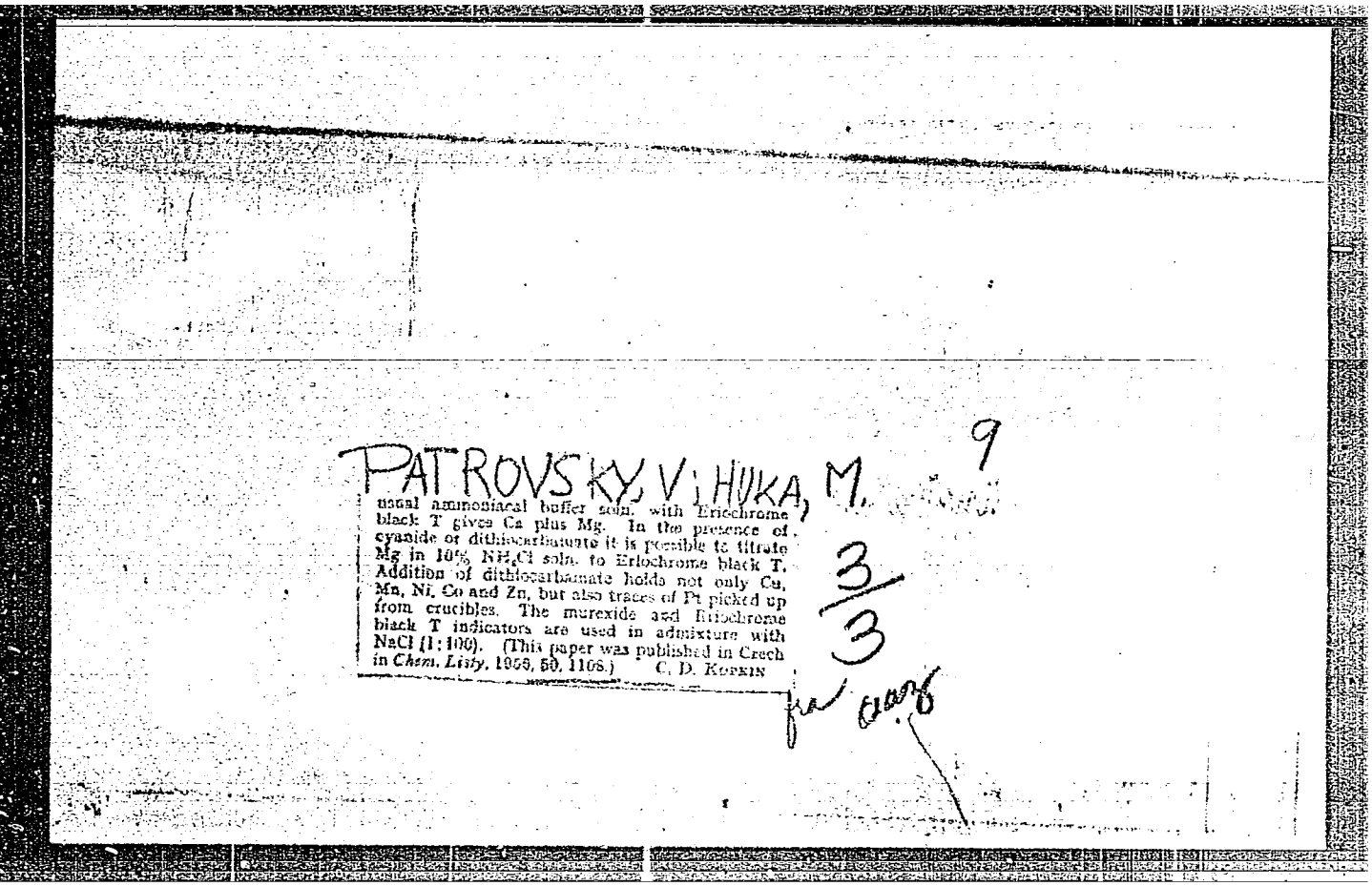

PATROVSKY, V.; HUSKA, M.

usual ammoniacal buffer soln. with Eriochrome black T gives Ca plus Mg. In the presence of cyanide or dithiocarbamate it is possible to titrate Mg in 10% NH_4Cl soln. to Erlochrome black T. Addition of dithiocarbamate holds not only Cu, Mn, Ni, Co and Zn, but also traces of Pt picked up from crucibles. The murexide and Eriochrome black T indicators are used in admixture with NaCl (1:100). (This paper was published in Czech in *Chem. Listy*, 1956, 50, 1168.) C. D. KOPKIN

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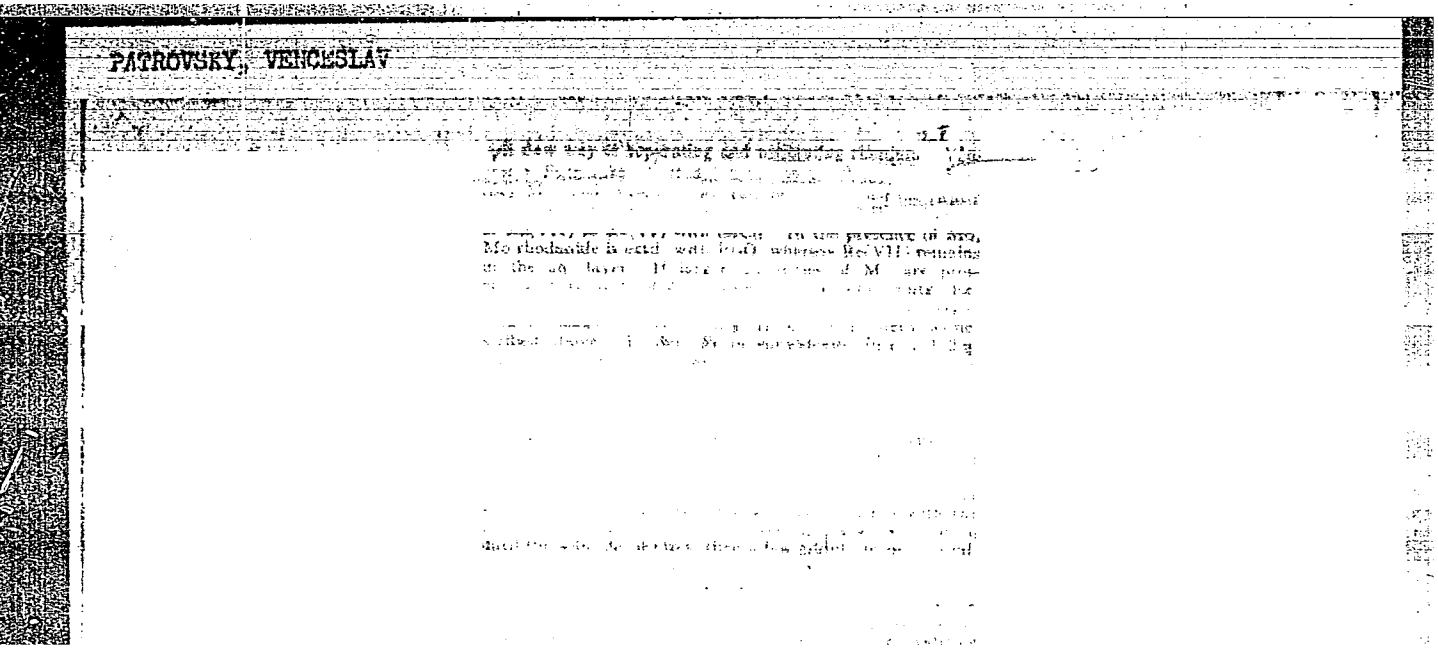
PATROVSKY, VENCESLAV



APPROVED FOR RELEASE: Wednesday, June 21, 2000 CIA-RDP86-00513R001239

PATROVSKY, V.

Use of morin in chemical analysis. II. Volumetric determination of gallium and indium with complexon III. Vinceslav Patrovský (Výzkumný ústav kovů, Panenské Břežany). Chem. Listy 47, 1338-41(1953); cf. C.A. 45 8167g.—The detn. of Ga and In is based on the titration with complexon III in the presence of morin. When equivalence is reached, the fluorescence of Ga and In compds. with morin disappears. If Al is present in the solns. of Ga and In, BF_4^- or F^- ions which extinguish the fluorescence of Al compd. with morin are added. To det. Ga in bauxite and silicates, fuse 5–10 g. of sample with 5 times its wt. of Na_2CO_3, digest the melt with hot water, remove SiO_2 if necessary, acidify with HCl, evap. to beginning of crystn. of NaCl, dil. with an equal vol. of concd. HCl, filter off the crystals of NaCl and $AlCl_3$, add a little $Na_2S_2O_3$ to reduce Fe^{+++}, ext. the soln. twice with Et_2O, dry the ext. contg. $GaCl_3$ with Na_2SO_4, evap. to dryness, mix the residue with 2 g. NaOAc, 2 g. NaCl, and 1 ml. AcOH, dil. to 60 ml., and titrate in ultraviolet light with complexon after the addn. of 0.5 ml. 0.1% soln. of morin in 00% EtOH and 2 ml. of a soln. contg., 1.8 g. cryst. $Na_2B_4O_7$ and 3.2 g. NaF in 100 ml. H_2O. Similarly titrate In in a soln. at pH 5 and contg. morin and F^-. A procedure for detn. of In in sphalerite is given. M. Hudlický

Chemical Abst.
Vol. 48
Apr. 10, 1954
Analytical Chemistry

CZECH

1189. **Photometric determination of vanadium by means of catechol.** V. Patrovský (*Chem. Listy*, 1954, **48** [4], 622–624).—A new method for the colorimetric determination of V is based on the formation of an intense blue coloration of V^{IV} with catechol, which is clearly discernible in concn. as low as 0·08 mg of V in 100 ml. The following metals interfere: Cu, Ni, Co and Cr, or Fe and Mn if present in quantity. Aluminium, if present in large amounts, separates in the neutral soln. as the hydroxide, and is best removed as the chloride by a current of HCl gas (Swift, *J. Amer. Chem. Soc.*, 1924, **46**, 2375). *Procedure*—Treat the soln. containing V at pH 4 to 5 with 10 per cent. aq. catechol (10 ml), 10 per cent. aq. $Na_2SO_3.7H_2O$ (10 ml) and ≃ 17 per cent. aq. NH_3 (10 ml), dilute to 50 ml and, after 5 min., measure the extinction through a yellow filter; max. absorption takes place at approx. 580 mμ. The method is especially suitable for the determination of traces of V in ores and minerals. G. Claser

PATROVSKY, V.

"Detection of Gallium Using Salicylidene-O-Aminophenol", P. 537, (CHEMICKE LISTY, Vol. 48, No. 4, April 1954, Praha, Czech.)

SO: Monthly List of East European Accessions, (EEAL), LC, Vol. 4, No. 3, Mar 1955, Uncl.

CZECH

2304. **Isolation and determination of small amounts of indium with sodium diethyldithiocarbamate.** V. Culíkovský (*Chem. Listy*, 1954, 48 [7], 1047–1050).—Indium is quantitatively precipitated with Na diethyldithiocarbamate (I) in the pH range 7 to 11. Much Sn and Sb interferes; any excess of Zn and Fe should also be removed. *Determination of In in ores containing Zn and Fe*—Decompose the sample (5 to 20 g) with acid or by alkaline fusion, evaporate the mixture with conc. H_2SO_4 (10 to 30 ml) to white fumes, dilute the residue to a 5 to 8 per cent. H_2SO_4 concn., filter off SiO_2 and $PbSO_4$, and add aq. NH_3 to pH 1. Reduce all Fe with the required amount of a saturated soln. of $Na_2S_2O_5$; the soln. becomes decolorised. Boil it to separate the sulphides of Cu, Bi, Sb, Ag and Pb, and adjust the pH to 6 by the addition of a saturated soln. of hexamethylenetetramine; boil the soln., rapidly collect the ppt. (Al, Ga, In and Sn) by suction, wash it with warm water, dissolve it in HCl and bring the soln. to boiling point after adding $KClO_3$. Treat it with 10 per cent. Na K tartrate, make alkaline with NaOH or aq. NH_3, add KCN to hold up Zn, Cu, Cd and other elements, and precipitate In in the warm with a 2 per cent. soln. of I (10 to 25 ml). Wash the ppt. on the filter with warm water containing tartrate and then with water alone, and either dry the ppt. at 105° C and weigh it as such (factor 0·2050), or convert it into In_2O_3 by calcining at 900° C (factor 0·8270). If required, the ppt. of In diethyldithiocarbamate can be also quantitatively extracted with chloroform or ethyl acetate.

G. GLASER

PATROVSKÝ, VENCESLAV

Combined photometric determination of vanadium and molybdenum with catechol. Vácslav Patrovský (Ústřední ústav geol., Prague). *Chem. Listy* 19, 804-7(1935). — The blue complex of catechol (I) with V(IV) (max. 600 mμ), and the orange complex with Mo (max. 400 mμ) were used for photometric detn. of both elements in the presence of one other. To det. V and Mo in ores, evap. 0.5-1 g. sample in a Pt dish with 0.5 ml. of 18N H_2SO_4 and 2-3 ml. 60% HF, heat the residue up to 500°, fuse with 2-4 g. $NaKCO_3$, 0.5-1 g. borax, and a grain of KNO_3, digest the melt with hot H_2O, add a few drops of 3% H_2O_2, boil, and filter. Acidify the filtrate with HCl to methyl orange, add a drop of Br water, evapn. to a smaller vol., cool, and dil. to 50-100 ml. Add 1 ml. satd. Na_2SO_3 to a 10-25 ml. aliquot, and after a few sec. 5 ml. 20% I, 1-2 g. NaOAc or NH_4OAc, 0.5-1 ml. 10% H_3PO_4, dil. to 50 ml., and measure the extinction at 600 mμ (V) and at 430 mμ (Mo). To det. V and Mo in steel, fuse the sample with Na_2O_2, remove Mn by boiling with H_2O_2 and continue as above. Large amts. of Cr and W interfere.

M. Hudlický

PATROVSKY, V.

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3297. Analytical chemistry of gallium. J. [illegible] V. Patrovsky, Z. Sulcek and [illegible]

[illegible] 49

[illegible]
of the metal [illegible]
The complexometric procedure is based on that of Patrovsky ([illegible] 1953, 2, 54). Procedure—Fuse a finely powdered sample (0·5 to 2 g for samples containing 0·01 to 0·5 per cent. of Ga) with six times its wt. of anhyd. Na_2CO_3, remove SiO_2 by filtration, and evaporate the filtrate to one-half of its vol. Add HCl to an acid concn. of 1 to 1·6 *M*, warm the soln. to 80° C and pass in H_2S. Filter off the pptd. sulphides, wash the residue on the filter with H_2O, and evaporate the combined filtrates to 50 ml. Treat the cooled soln. with a sufficient amount of a saturated soln. of $Na_2S_2O_4$ to reduce all the Fe^{III} followed by an equal vol. of conc. HCl. Extract the soln. with ether (2 × 30 ml), evaporate the extracts to dryness, moisten the residue with a few drops of HNO_3 and again evaporate. Dissolve the residue in a small quantity of HCl (1 + 1), filter the mixture, and precipitate the Fe in the filtrate with 10 per cent. NaOH. Filter off the ppt. of $Fe(OH)_3$, wash it with 5 per cent. NaOH, neutralise the alkaline filtrates with H_2SO_4 to an acid concn. of 10 to 16 per cent., cool the soln. to 10° C and treat it with a 6 per cent. aq. soln. of cupferron. After 30 min.

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Patrovský, J. Doležal, ...

collect the ppt. and wash it with 6 per cent H_2SO_4, ignite the filter paper with the ppt., first at 400° C, then at 1000° C. Weigh the crude Ga_2O_3, then fuse it in a platinum dish with $KHSO_4$ (2 to 3 g), dissolve the melt in a small amount of 1 per cent. HCl, dilute the soln. to 50 ml and use it as stock. For the volumetric determination of Ga, treat an aliquot portion of the stock soln. with acetate buffer (pH 3·8), $NaBF_4$ soln. (prepared by acidifying a soln. of NaF (3·4 g) and boric (2 g) in H_2O with acetic acid and diluting to 100 ml) (1·5 ml) and a few drops of a 0·2 per cent. soln. of morin in 50 per cent. ethanol, and titrate the soln. with 0·01 *M* EDTA (disodium salt) in u.v. light to the disappearance of the green fluorescence. To determine Ga polarographically, evaporate an aliquot portion of the stock soln. to dryness, dissolve the residue in hot H_2O (1 to 3 ml), dilute the soln. with conc. aq. NH_3 containing 2 *M* NH_4Cl to 25 or 50 ml, and polarograph from −1·2 V (vs. the S.C.E.)

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PATROVSKY, V.

1167. Detection of gallium by means of o-salicylideneaminophenol. V. Patrovsky (*Chem. Listy*, 1954, 48 (4), 537–538). A study of the reactions of o-salicylideneaminophenol (I) with In, Ga, Ge and Sc has shown that only Ga reacts, giving a yellow fluorescence with a green tint in weakly acidic solutions (pH 4·5 to 5·5). A similar fluorescence, given with I by Al can be screened with $NaBF_4$. *Procedure*—An HCl soln. of the sample containing Ga, buffered with Na acetate and acetic acid is treated with a 0·05 per cent. soln. of I in ethanol (0·5 ml) and with a few ml of aq. $NaBF_4$ prepared by dissolving 1·8 g of cryst. borax and 3·2 g of NaF in 80 ml of H_2O acidified with acetic acid and diluting to 100 ml). The fluorescence is clearly observed in dilutions of > 0·08 mg of Ga per 50 ml. Procedures are given for the detection of Ga in aluminium, bauxite, silicates and sphalerite. G. GLASER

PATROVSKY, V.

Isolation and determination of small amounts of indium with sodium diethyldithiocarbamate. V. Patrovský (Chem. Listy, 1954, 48, 1047—1050).—In in quant. ppts. with Na diethyldithiocarbamate in the pH range 7—11. Much Sn and Sb interfere; it is also advisable to remove excess of Zn and Fe. Detailed procedure for the determination of In in ores containing Zn and Fe is given.

O. GLAFFEY

Patrovsky, V.

3088. **Use of morin in chemical analysis. III. Photometric determination of quadrivalent tin.** V. Patrovský (Ústřední ústav geol., Prague, Czechoslovakia) (*Chem. Listy*), 1954, 48 [11], 1694–1695).—A colorimetric method for the determination of Sn^{IV}, based on the formation of a blue complex of Sn^{IV} with morin in a weakly acidic soln., is described. *Procedure*.—The sample (0·1 to 0·3 g) is dissolved in the min. quantity of HNO_3, 0·3 ml of conc. HCl is added and the soln. is evaporated almost to dryness; the residue is moistened with conc. HCl and again evaporated. The residue is dissolved in 2 ml of conc. HCl, the soln. is diluted with 10 ml of H_2O, cooled, treated with 2 ml of a 0·2 per cent. soln. of morin in 50 per cent. ethanol, diluted to 50 ml and the extinction is measured, a violet filter of max. transmittance at 430 mμ being used. The procedure is applicable even in the presence of a considerable excess of Cu, but Sb, Ti, Mo, W, Ta, Nb, Zr, Th, F', oxalates and excess of tartrates interfere. G. GLASER

PATROVSKY, V.

3

The Simultaneous Determination of Vanadium and Molybdenum by Pyrocatechol. V. Patrovsky. (Chem. Listy, 1955, 49,(6), 854-857). [In Czech]

PATROVSKY, V.

"Photometric Determination of Vanadium with Pyrocatechol", . (CZ,
(CHEMICKE LISTY, Vol. 48, No. 4, April 1954, Praha, Czech.)

SO: Monthly List of East European Accessions (EEAL), LC, Vol. 4, No. 3,
March 1955, Unclassified.

V. PATROVSKY

(2) 1

Photometric determination of vanadium with pyrocate-
chol. V. Patrovský (Výzkumný Ústav Kovů, Panenské
Břežany, Czechia). *Chem. Listy* 48, 622–5(1954).—The
colorimetric detn. of V is based on the formation of a blue
color in the reduction of VO_3^- to VO^{++} with *o*-$C_6H_4(OH)_2$ (I).
To det. V in minerals, evap. 2–3 g. of sample with H_2SO_4
and HF, fuse the residue with 10 g. Na_2CO_3, digest with H_2O,
(if the soln. is green owing to the presence of Mn, add
MeOH), filter, neutralize the filtrate, and dil. to the mark in
a volumetric flask. To a 5–15 ml. aliquot add 10 ml. 10%
soln. of I, 10 ml. 10% Na_2SO_3, 10 ml. 17% aq. NH_3, and
measure the extinction after 10 min. with a yellow or orange
filter. Cu, Ni, Co, Cr, and large amts. Fe and Mn inter-
fere. M. Hudlický

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PATROVSKY, V.

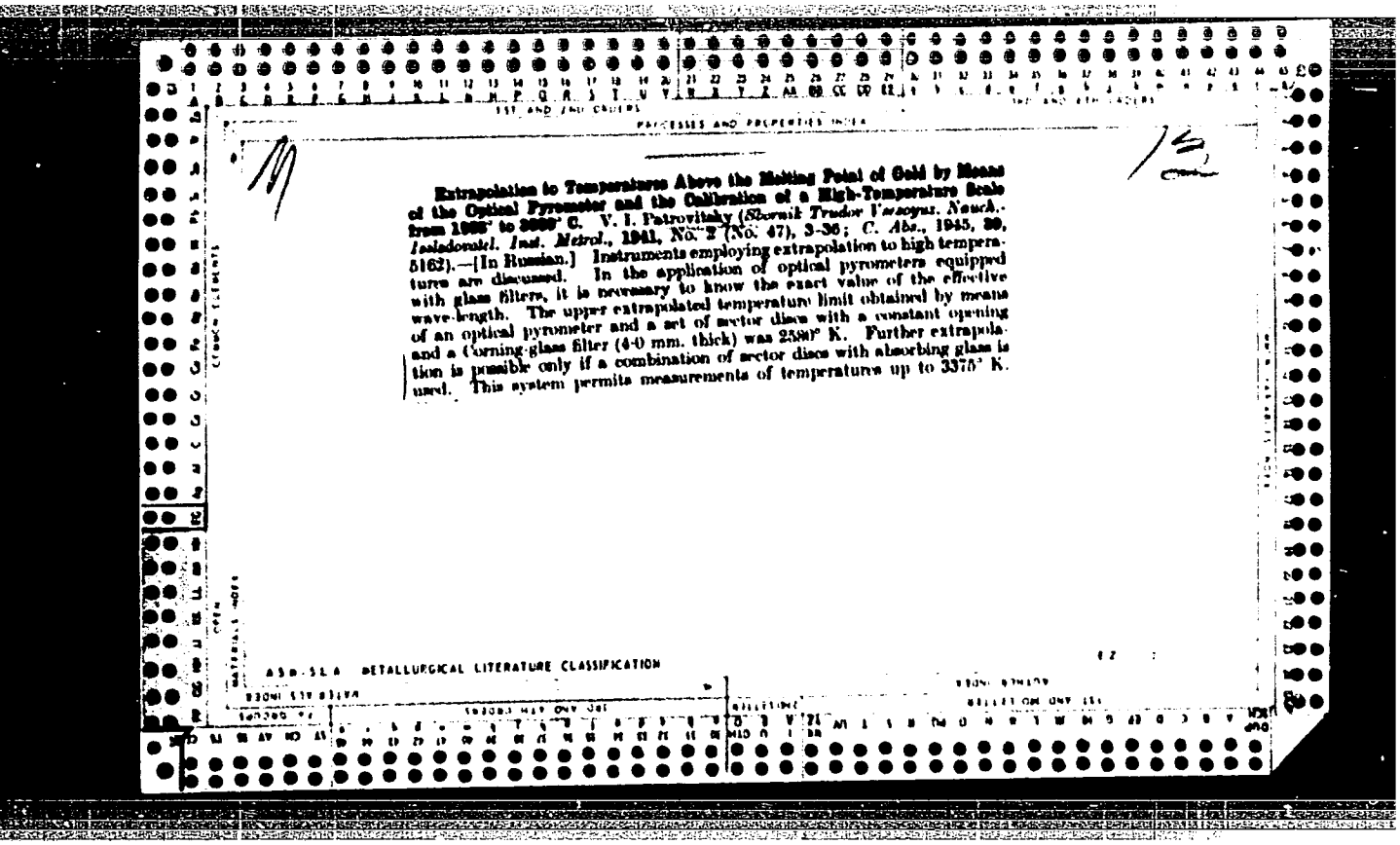
"Use of Morin in Chemical Analysis. I. Detection of Certain Metals Using Morin" p. 676, (CHEMICKE LISTY, Vol. 47, no. 5, May 1953, Praha, Czechoslovakia).

SO: Monthly List of East European Accessions, LC, Vol. 2, No. 11, Nov. 1953, Uncl.

PATROVSKÝ, V. Czech CA: 10987

"Phosphorescence of alkaline earth sulfides and oxides, and of the sulfide and oxide of zinc."

Chemie (Prague) 8, 194-6 (1952)



Extrapolation to Temperatures Above the Melting Point of Gold by Means of the Optical Pyrometer and the Calibration of a High-Temperature Scale from 1063° to 3000° C. V. I. Patrovitsky (*Sbornik Trudov Vsesoyuz. Nauch.-Issledovatel. Inst. Metrol.*, 1941, No. 2 (No. 47), 3-36; *C. Abs.*, 1945, **39**, 5163).—[In Russian.] Instruments employing extrapolation to high temperatures are discussed. In the application of optical pyrometers equipped with glass filters, it is necessary to know the exact value of the effective wave-length. The upper extrapolated temperature limit obtained by means of an optical pyrometer and a set of sector discs with a constant opening and a Corning-glass filter (4·0 mm. thick) was 2580° K. Further extrapolation is possible only if a combination of sector discs with absorbing glass is used. This system permits measurements of temperatures up to 3370° K.

ASM-SLA METALLURGICAL LITERATURE CLASSIFICATION

PATROVSKY, Venceslaw

(2)

Detection of gallium with *o*-(salicylideneamino)phenol. Věnceslav Patrovský (Výzkumný Ústav Kovů, Panenské Břežany, Czech.). *Chem. Listy* 48, 537–8(1954).—Ga gives in acidic solns. (pH 4.5–5.5) with *o*-(salicylideneamino)phenol (I) a yellow fluorescence with a green shade. Similar fluorescence of Al can be screened with BF_4^-, even in the presence of a 1000-fold excess of Al. Colored ions interfere. A sample contg. Ga is dissolved in dil. HCl, buffered with NaOAc, and the soln. treated with 0.5 ml. 0.05 alc. soln. I and a few ml. of 0.2*M* $NaBF_4$ to give a yellow fluorescence. The method is suitable for detg. Ga in Al, in *bauxite*, *sphalerite*, and *silicates*. M. Hudlický

11-9-54
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DARABONT, Alex, [illegible] ACHIM, St[illegible]; [illegible] PATRU, Cr., ing.

A new type of drilling device [illegible] distribution through the piston.
Rev min 15 no.2:87-91 F 64.

PATRULIS, D.

3(0)

AUTHOR: Babinets, A. Ye., Candidate of Geological-Mineralogical Sciences SOV/30-59-1-16/57

TITLE: Congress of Geologists of the Carpathians and Balkans (S"yezd geologov karpatskikh i balkanskikh stran)

PERIODICAL: Vestnik Akademii nauk SSSR, 1959, Nr 1, pp 85 - 89 (USSR)

ABSTRACT: The 4th Congress of the Carpathian-Balkan Association took place in Kiyev and Lvov on September 16-29, 1958, 250 delegates taking part. Members of the Association are Bulgaria, Hungary, Poland, Rumania, the USSR, Czechoslovakia and Jugoslavia. The reports discussed tectonics of the Carpathians and their mutual relationship with the Balkanides, the stratigraphy and paleogeography of the Carpathians, vulcanicity in the Carpathians, and the formation of different mineral resources in them. O. S. Vyalov, on behalf of the organizing committee of the Congress, reported on questions of tectonics of the Soviet East Carpathians. M. Nagel reported on tectonic investigations in the Central West Carpathians by Czechoslovak geologists. The Hungarian and Rumanian investigators F. Sentesh, M. Blyatha, I. Dumitresku, I. Motyash, D. Patrulis reported on the structure

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of the South Carpathians. The Bulgarian scientist Ye. Bonchev outlined the mutual relationship between Carpathians and Balkanides. The Polish researchers G. Świdziński supported the hypothesis on the deposit structure of the West Carpathians. V. I. Slavin, N. Filipesku (Rumania), M. Ksiażkiewicz (Poland) and the Czechoslovak researchers A. Matejka, J. Lomes reported on questions of stratigraphy and paleogeography. The Soviet researchers (N. B. Vassoyevich, O. S. Vyalov) assume that the formation of flysch deposits in the Carpathians is associated with the most mobile zones of the earth's crust. N. B. Vassoyevich proved in the district of Staryy Sambor the impossibility of a formation of flysch layers in the Soviet East Carpathians. Reports by E. Kardosh-Sadetskiy (Hungary), D. Dzhushko (Rumania) and the Soviet investigators Ye. K. Lazarenko considered questions of vulcanicity and conditions of formation of ore deposits. The Congress emphasized the necessity of carrying on common investigations in different branches of geology. For a coordination of these investigations, permanent commissions were constituted: for tectonics, stratigraphy, paleogeography and paleontology; magmatism and petrology, geochemistry and mineralogy, hydrogeology and for tectonic maps. The 5th Congress of the Association is anticipated for 1961 in Rumania.

Card 2/3

PATRULIUS, Dan

Stratigraphic study of the Mesozoic and Paleozoic deposits crossed in the drilling at Ce*ate (western part of the Rumanian Plain). Dare seama sed 49 pt.1:81-91 '61-'62 [publ. '64].

1. Submitted April 13, 1962.

PATRULIUS, D., NEAGU, T.

On the presence of Dinantian in the subsoil of the Rumanian Plain (Mesozoic Massif). Rev geol geog Rum 7 no. 2: 203-207 '63.

PATRULIUS, D. (Rumyniya); POPESKU, Gr. [Popescu. G.] (Rumyniya)

Facies of the wild flysh and klippe of the sedimentary origin in Bukovina and Maramures. Mat.Karp.-Balk.assots. no.1:168-176 '60. (MIRA 14:12)

(Rumania--Geology)

PATRULIUS, D.; CONTESCU, L.; BUTAC, A.

Research on the Cretaceous Flysch in the upper valley of the Trotus River and the surroundings of the city of Miercurea Ciuc, Eastern Carpathians. Studii cerc geol 7 no.3/4:409-428 '62.

PATRULIUS, D.; NEAGU, T.

On the presence of Dinantiar in the foundation of the Rumanian Plain (Moesia Massif). Studii cerc geol 8 no. 2: 195-200 '63.

1. Comunicare prezentata de academician G. Murgeanu.

PATRULIUS, D. (Rumyniya); MOTASH, I. [Motas, I.] (Rumyniya);
BLYAKHU, M. [Bleahu, M.] (Rumyniya)

Geology of the Rumanian Maramures. Mat.Karp.-Balk.assots. no.1: 74-89 '60. (MIRA 14:12)
(Maramures--Geology)

PATRULIUS, D. (Rumyniya); POPESKU, Gr. (Rumyniya)

Wild flysh facies and sedimentary klippens in Bukovina and Maramures.
Mat.Karp.-Balk.assots. no.3:77-89 '60. (MIRA 14:12)
(Bukovina—Flysh)
(Maramures—Flysh)

Patrulius, D.; Contescu, L.; Murgeanu, G.

The cretaceous Flysch in the Valea Tirlugului, Eastern Ca pathian basin. p.7.

STUDII SI CERCETARI DE GEOLOGIE. Bucuresti, Rumania. Vol. 4, No. 1, 1959.

Monthly List of East European Accessions (EEAI) LC, Vol. 9, No. 1, Jan 1960.

Uncl.

CODARCEA, Al., acad.; MARINESCU, Fl.; PATRULIUS, D.

Some new data on the Mesozoic limestones of Gura Vaii (Plateau Mehedinti). Comunicarile AR 12 no.4:457-465 Ap '62.

Patrulius, D.; Murgeanu, G.

The cretaceous Flysch in the Predelus Pass region, Eastern Carpthians. p. 25.

STUDII SI CERCETARI DE GEOLOGIE. Bucuresti, Rumania. Vol. 4, No. 1, 1959.

Monthly List of East European Accessions (EEAI) LC, Vol. 9, No. 1, Jan 1960.

Uncl.

PATRULIUS, D.; TOCORJESCU, M.;

Stratigraphic study of the neo-Jurassic, Cretaceous, and Neocene deposits penetrated by the Atirnati (Cimpia Romina) drilling. Dari seama sed 47:117-130 '59/60 [publ. '62].

PATRULIUS, D.

Paleontogic reserves; fossiliferous places declared natural monuments. p. 181. (Ocrotirea Naturii, No. 2, 1956, Bucuresti, Rumania)

SO: Monthly List of East European Accessions (EEAL) Lc. Vol. 6, No. 8, Aug 1957. Uncl.

PATRUNOV, D.K.

Straining as an effective method for studying carbonate rocks.
Inform. sbor. NIIGA no.30:72-82 '62. (MIRA 17:1)

PATRUNOV, D.K.

Origin of natural gases in the Noril'sk region. Inform. sbor. NIIGA no.31:67-76 '62. (MIRA 16:12)

PATRUNOV, P., inzh.

Electronic constructor. Nauka i zhizn' 28 no.10:58-62 O '61.
(MIRA 15:1)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut elektromekhaniki.
(Electric motors, Induction) (Electronic calculating machines)

L 44298-66 EWT(d)/EWP(w)/EWP(k)/EWP(h)/EWP(t) BC

ACC NR: AP6021989 (A) SOURCE CODE: UR/0025/66/000/002/0040/0043

AUTHOR: Patrunov, F. (Engineer)

77

B

ORG: none

TITLE: An automatic locomotive engineer is in control

SOURCE: Nauka i zhizn' , no. 2, 1966, 40-43

TOPIC TAGS: railway equipment, locomotive engineering, arithmetic unit, computer storage device, gamma radiation, automatic control system, control circuit

14

ABSTRACT: A schematic diagram is shown of the electronic system which runs trains automatically on the Moscow-Klin section of the Moscow-Leningrad Railroad (see Fig. 1). The system consists of two cabinets one of which—the power-supply cabinet—produces the voltages and pulses required for the operation of the electronic circuits, while the other contains the arithmetic unit, storage devices, and train-control blocks. The movement of the train is determined by the integration of the

Card 1/2

6(6) SOV/162-58-3-22/26

AUTHOR: Patrunov, V.G.

TITLE: Qualitative Indexes of the Ferrographic Receiving Method of Phototelegraph Pictures (Kachestvennyye pokazateli ferrograficheskogo metoda priyema fototelegrafnykh izobrazheniy)

PERIODICAL: Nauchnyye doklady vysshey shkoly, Radiotekhnika i elektronika, 1958, Nr 3, pp 162-170 (USSR)

ABSTRACT: The author reviews the qualitative indexes of the magnetic (ferromagnetic) method of receiving phototelegraph pictures. He establishes the basic relations for defining aperture distortions, starting with the conception of the variable aperture, and the connection between the resolving power and the half-tone characteristics. The problem of correcting the half-tone characteristic requires additional investigation and the author furnishes only a few suggestions for correcting the half-tone characteristics. The author expresses his gratitude to the scientific supervisor of this subject, Professor I.Ye. Goron,

Card 1/2

AUTHORS: Vatsenko, V.A. and Patrunov, V.G. SOV/106-58-7-8/18

TITLE: Ferrography - a Magnetic Method of Recording Images (Ferrografiya - magnitnyy metod zapisi izobrazheniy)

PERIODICAL: Elektrosvyaz', 1958, Nr 7, pp 49 - 55 (USSR)

ABSTRACT: Since 1956, work has been carried out at the MEIS (Moscow Electrotechnical Communications Institute) on the application of ferrography to the recording of photo-telegrams. The article contains a short description of the basic elements of the process involved and of some of the items of equipment. The processes of optical and magnetic recording are compared in Figures 1 and 2, respectively. It will be seen that the magnetic method is the simpler since the "negative" stage is eliminated. Figure 3 shows the principle of the recording method. The medium used is in the form of a drum rather than a tape since it is not inclined to warp or stretch. The gap width in the recording head is between 10 and 15 μ, which guarantees the recording of the entire spectrum of the photo-telegraphic signal (1 300 ± 550 c/s when n = 60 rpm). The drum diameter is 9 cm. The other dimension of the gap is such as to give 5 lines/mm in the image. Figure 4

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shows a recording position with a removable head. The signal is recorded exactly as received, there being no need for previous detection as in the optical case. The bias frequency is 80 kc/s. The recording materials used differ somewhat from those used in sound recording since a large dynamic range is not required. The materials tested include: Type 1 (B_r = 370 - 500 Gauss; H_c = 70 - 100 Oe), Type 2 (B_r = 700 - 750 Gauss; H_c = 220 - 250 Oe) and a tape for contact printing using powder Nr 101-a (B_r = 800 - 950 Gauss; H_c = 550 - 700 Oe). Images using Type 1 material were dim and lacking contrast; those using Type 2 and 101-a material were satisfactory. The development process may use powders of different colours and multi-colour images are said to be possible. Figure 5 shows a plot of optical density in the image vs. excitation for Type 2 material. Amplitude modulation may be used but for best results variable-area recording is preferred. Descriptive details of possible drum constructions are given. Re-duplication methods are outlined which give up

Ferrography - A Magnetic Method of Recording Images SOV/106-58-7-8/18

to 250 copies. Figure 6 shows a recording which corresponds in size to an ordinary telegram blank. The author thanks I.Ye. Grunov for posing the problem and scientific guidance. He is also grateful to technical students M.A. Lesnichenko and A.A. Rolik for assistance.
There are 5 figures and 8 references, 6 of which are Soviet and 2 English.

ASSOCIATION: MEIS

SUBMITTED: January 8, 1958

Card 3/3 1. Facsimile recording systems--Performance

PATRUNOV, F.G., inzh.; SVYATOSLAVSKIY, V.A., inzh.; MAZIYA, L.V., inzh.

Study of a generator-motor system with an exciter and amplidyne.
Vest.elektroprom. 33 no.12:36-40 D '62. (MIRA 15:12)
(Electric machinery)

PATRUNOV, F.G., inzh., starshiy nauchnyy sotrudnik

Automated blooming mills. Nauka i zhizn' 30 no.4:18-25 Ap '63. (MIRA 16:7)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut elektromekhaniki.

(Rolling mills)
(Automatic control)

PATRUHOV, F.G., inzhener.

Controlling the correctness of connections and locating damage in the windings of a.c. motors. Energetik 5 no.3:22-23 Mr '57. (MLRA 10:3)

(Electric motors, Alternating current)

27014 S/123/61/000/016/011/022
A004/A101

6.1360

AUTHOR: Patrunov, V.G.

TITLE: Ferrographic recording of facsimile images

PERIODICAL: Referativnyy zhurnal, Mashinostroyeniye, no. 16, 1961, 23, abstract 16Zh182 (V sb. "Elektrofotogr. i magnitografiya", Vil'nyus, 1959, 286 - 299, Lithuanian summary)

TEXT: The author analyzes recording systems of electric signals for the visualization of images and for the production of ready reproductions, and recording systems for the temporary conservation of signals which are then reproduced in an electric form. The dynamic range of the facsimile image depends on the optical properties of the image on the paper and amounts to a maximum of 35 decibels. The frequency spectrum of the facsimile videosignal is of a complex nature and depends both on the image being transmitted and on the operation speed and the system resolution power. In phototelegraphy the signal spectrum is carried into the middle of the communication channel band by amplitude or frequency modulation of the sub-carrier frequency. To obtain the necessary legibility in ferrographic recording, special narrow magnetic heads are used ensuring a dynamic

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Ferrographic recording of facsimile images

range of 35 decibels. To increase the effectiveness of development, the signal level in ferrography is somewhat raised compared with the level in sound recording. In ferrography the optimum results are obtained by recording with the amplitude-modulated signal directly, since the image contrast is increased in this way (after development). The development process of the image signal recordings in ferrography is effected by the powder method (basic) or by the method of "softening the magnetic layer of the carrier". The latter method is only suitable for the development of ferromagnetic films on an acetyl cellulose base. It is emphasized that the semitone characteristics and the resolving power of ferrography depend on the magnitude of the recording raster element, i.e. on the developed magnetic print which represents a minimum possible trace of the magnetic recording. The dimensions of the raster element in ferrography are not a constant magnitude but grow linearly with an increase in the recording level. If the signal level is selected in the right way, it is possible to obtain a resolving power of the ferrographic reception of not less than 5 - 7 lines per mm. It was found experimentally that images obtained by the ferrographic method are, as regards quality, superior to electrochemical images, and are inferior to images obtained by photorecording, particularly in semitones. However, the magnetic recording possesses a low inertness which makes it possible to effect the facsimile reception with a

Card 2/3

GITLITS, M.V.; PATRUNOV, V.G.

Correction of halftone characteristics in magnetic recording of phototelegraphic images. Nauch. dokl. vys. shkoly; radiotekh. i elektron. no.2:311-319 '59. (MIRA 14:5)

1. Laboratoriya magnitnoy zapisi NIO Moskovskogo elektrotekhnicheskogo instituta svyazi.
(Phototelegraphy)

ACCESSION NR: AR4014145 S/0137/63/000/012/D015/D015

SOURCE: RZh. Metallurgiya, Abs. 12D90

AUTHOR: Patrunov, V. G.

TITLE: No-waste rolling of parts from magnetic powders

CITED SOURCE: Tr. Kuyby*shevsk. aviats. in-t, vy*p. 16, 1963, 107-113

TOPIC TAGS: Magnetic powder rolling, hard magnetic alloy, ferrographic reproduction

TRANSLATION: The technology and equipment for rolling parts from magnetic powder are described. The method consists in the transfer of the drawing as a magnetic picture of the part onto one of the pressure rolls, the surface of which is covered with an alloy having hard-magnetic characteristics. Diagrams of the rolling, of the device for transferring the drawing of the part onto the roll, and of a ferrographic figure-printing device are given. A. Leont'yev.

DATE ACQ: 09Jan64 SUB CODE: ML ENCL: 00

Card 1/1

GORON, I.Ye.; ARUTYUNOV, M.G.; MARKOVICH, V.D.; PATRUNOV, V.G.; TRAUBENBERG, V.P.

High-speed ferrographic recording of digital data. Elektrosviaz' 16 no.12:26-32 D '62. (MIRA 16:1)

(Telecommunication)
(Printing machinery and supplies)

PATRIKOV, V.V.

Amino acids in the blood in hepatolenticular degeneration.
Zhur. nevr. i. psikh. 63 no.8:8 '63. (MIRA 17:1)

1. Institut nevrologii (direktor - prof. N.V. Konovalov) AMN SSSR, Moskva.

PATRUNOVA, V.P.

Copper and amino acid metabolism disorders in clinically healthy relations of patients with hepatolenticular degeneration. Zhur. nevr. i psikh. 62 no.5:688-693 '62. (MIRA 15:6)

1. Institut nevrologii (dir. - prof. N.V. Konovalov) AMN SSSR, Moskva.
(HEPATOLENTICULAR DEGENERATION)
(COPPER METABOLISM) (AMINO ACID METABOLISM)

PATRUNOVA, V. P., MITTELSHTEDT, A. A., and BAUMAN, L. K. (USSR)

"Aminoferases of Blood Serum and the Amino Acid Metabolism during Hepato-Cerebral Dystrophy."

Report presented at the 5th International Biochemistry Congress, Moscow, 10-16 Aug 1961

PATRUNOVA, V. P.

Cand Med Sci - (diss) "Metabolism of aminoacids in hepato-lenticular degeneration." Moscow, 1961. 15 pp; (Academy of Medical Sciences USSR); 250 copies; price not given; (KL, 5-61 sup, 204)

PATRUNOVA, V.P.

Problem of amino acid metabolism in hepatolenticular degeneration. Zhur.nevr.i psikh. 60 no.9:1146-1152 '60. (MIRA 14:1)

1. Institut nevrologii (dir. - prof. N.V. Konovalov) AMN SSSR, Moskva.
(HEPATOLENTICULAR DEGENERATION) (AMNIO ACIDS)

MOSHCHIN, I., instruktor-aviamodelist (Rzhev, Kalininskoy obl.); BLINOV, B., inzh.-konstruktor (Moskva); PATRUSHEV, A.; GROMOV, V., instruktor aviamodel'noy laboratorii (Penza); TIMOFEYEV, A., obshchestvennyy instruktor (Leningrad); POPOV, M.

The new direction in airplane modeling. Kryl. rod. 15 no.12:26 D '64. (MIRA 18:3)

1. Rukovoditel' aviamodel'nogo kruzhka Doma pionerov, Sovetsk, Kirovskoy oblast (for Patrushev). 2. Predsedatel' aviamodel'nogo komiteta Federatsii aviatsionnogo sporta Ukrainy, Kiyev (for Povov).

RUTBERG, G.B.; PATRUSHEV, A.S., starshiy inzhener po oborudovaniya

Operation of freight-lifting cranes at the Stalingrad Hydroelectric Power Station. Bezop.truda v prom 4 no.6:30-32 Je '60. (MIRA 14:3)

1. Zamestitel' glavnogo inzhenera po mekhanizatsii Stalingradgidrostroya (for Rutberg).
(Stalingrad Hydroelectric Power Station)
(Cranes, derricks, etc.)

AKHMATOV, A.P.; BLINOV, P.I.; BOLOTIN, V.F.; BORODIN, A.V.; GAVRIN, P.P.; ZAVOYSKIY, Ye.K.; KOVAN, I.A.; OGANOV, M.N.; PATRUSHEV, B.I.; PISKAREV, Ye.V.; RUSANOV, V.D.; SMOLKIN, G.Ye.; STRIGANOV, A.R.; FRANK-KAMENETSKIY, D.A.; CHEREMNYKH, P.A.; CHIKIN, R.V.

Magnetoacoustic resonance in a plasma. Zhur. eksp. i teor. fiz. 39 no.3:536-544 S '60. (MIRA 13:10)
(Nuclear magnetic resonance)
(Plasma (Ionized gases))

88419

S/056/60/039/006/003/063
B006/B056

26.2311

AUTHORS: Rusanov, V. D., Patrushev, B. I., Kovan, I. A., Garkusha, V. I., Frank-Kamenetskiy, D. A.

TITLE: Investigation of the Magneto-acoustic Resonance in a Plasma by Means of Two Electrical Probes

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 6 (12), pp. 1497 - 1502

TEXT: This is a report on concentration measurements made on a cylindrical hydrogen plasma, which was located in a homogeneous quasistatic longitudinal magnetic field H_0, and a high-frequency magnetic field in the same direction. Two molybdenum wire probes were used to estimate the charged particle concentration; probing was done also with the 3-cm pulses of a klystron-generator. The experimental arrangement is shown in Fig. 1, the probe circuit diagram in Fig. 3. Fig. 5 is shown as an example of the oscillograms obtained (Figs. 4-9): the upper oscillograms show the probe currents of various pairs of probes, the lower ones show the signals of

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Investigation of the Magneto-acoustic Resonance in a Plasma by Means of Two Electrical Probes

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the sound shf generator; I - probes on the walls, II - in the chamber axis. (U_{probe} = 300 v, E = 6kv, H_o = 5.8 koe, p = 8.10^{-4}mm Hg). The probe current has two maxima, viz. at H_o = 650 oe (n = $6.10^{12}cm^{-3}$) and H_o = 1580 oe (n = $5.10^{12}cm^{-3}$) (n - electron concentration). With a change of the quasistatic magnetic field, the amplitude of the alternating field was found to have two or three resonance maxima, interpreted as magneto-acoustic resonance. The resonance frequencies are near the geometrical mean from electronic and ionic cyclotron frequency (ω_e, ω_i). Numerically one obtains:

$$\omega^* = H_o\omega_i \sqrt{4\pi\rho R}$$

$$\omega = \omega_i\omega_e \left[1 + \frac{1}{\Pi^*}\frac{\omega_e}{\omega_i}\frac{k_z^2}{k_r^2}\right]\left[\Pi^* + 1 + \frac{\omega_e^2}{\omega_o^2}\right]$$

$$\sqrt{\omega_i\omega_e}$$

	1st maximum	2nd maximum
	$6.0.10^7$	$3.1.10^8$
	$7.3.10^7$	4.10^8
	$2.5.10^7$	$6.5.10^8$

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Investigation of the Magneto-acoustic Resonance in a Plasma by Means of Two Electrical Probes

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(The generator frequency was $3.2.10^8$). ω^* is the circular frequency of the radial magneto-acoustic oscillations, ω-the circular frequency of the longitudinal-radial magnetoacoustic oscillations; the other quantities are defined in Ref. 5. Summing up: Under magneto-acoustic resonance, ionization increases rapidly and considerably. The radial concentration distribution in the plasma is nearly uniform. The authors thank Ye. K. Zavoyskiy for his interest. There are 10 figures and 5 references: 4 Soviet and 1 US.

SUBMITTED: April 23, 1960

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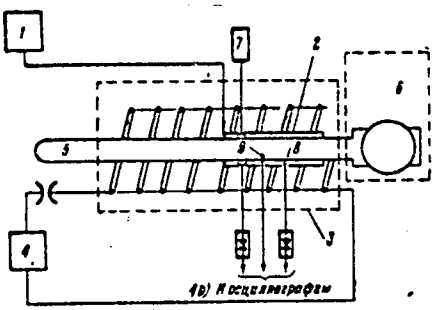

Fig. 1

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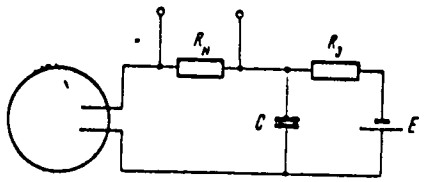

Рис. 3. Схема включения зондов

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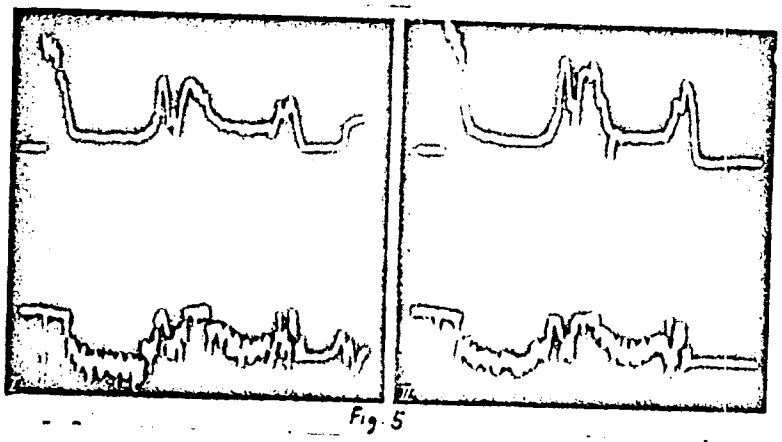

Fig. 5

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Text to Fig. 1: 1) Generator (150 kw, 42 - 50 Mc), 2) Oscillation circuit. 3) Solenoid for producing the magnetic longitudinal field (H_{max} = 16 koe). 4) Capacitor battery for feeding the solenoid. 5) Cylindrical glass vacuum chamber. 6) Evacuation system. 7) Sounding shf generator (λ = 3 cm). 8) Magnetic probe. 9) Double electric probes. 10) to the oscilloscope.

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88420
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B006/B056

9.9845
26.2321

AUTHORS: Patrushev, B. I., Rusanov, V. D., Kovan, I. A., Savichev, V.Y., Frank-Kamenetskiy, D. A.

TITLE: Gyrotropic Properties of a Plasma During the Propagation of an Extraordinary Wave

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, 1960, Vol. 39, No. 6 (12), pp. 1503 - 1507

TEXT: This is a report on investigations of the propagation of electromagnetic waves in a cylindrical plasma column, which is located in a homogeneous quasistatic magnetic field H_o. The hydrogen plasma (8.10^{-4} mm Hg) was generated by means of an ionization generator (50 Mc/sec, 150 kw) in a glass cylinder. The high-frequency magnetic field coincided with the static field as to direction. A detailed description of the experimental arrangement is given in Ref. 1. The plane-polarized waves were produced by a sounding generator with 29 Mc/sec and 500 w, whose operation was not disturbed by discharges. The block diagram for investigating the signal from the magnetic probe, located in the anodic circuit of the sounding

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Gyrotropic Properties of a Plasma During the Propagation of an Extraordinary Wave

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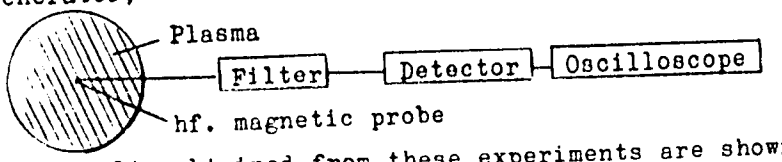
B006/B056

generator, had the following aspect:



The results obtained from these experiments are shown in a number of oscillograms and are numerically given in a Table. It could be proven that in the propagation of a wave whose frequency is between the ion- and electron cyclotron frequencies, both the wave vector and the polarization vector rotate in the plasma waveguide. This result is of interest for the retaining and hf-heating of plasma. The authors thank Ye. K. Zavoyskiy for his interest and L. I. Rudakov for discussions. There are 10 figures, 1 table, and 6 Soviet references.

SUBMITTED: April 23, 1960

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B006/B056

i	H_{ri}, Oe	n	σ_i	λ_{pi} / L_M	ω_0	ω_i
1	450	$6 \cdot 10^{18}$	13300	8,6	$7,8 \cdot 10^9$	$4,3 \cdot 10^9$
2	1370	$6 \cdot 10^{18}$	4400	13	$24 \cdot 10^9$	$13,3 \cdot 10^9$
3	2280	$5 \cdot 10^{18}$	2200	19	$39 \cdot 10^9$	$22 \cdot 10^9$

X

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Text to the Table: i denotes the amplification of the passing signal, n - the plasma density, $\varepsilon_{\parallel}$ the longitudinal component of the dielectric constant, λ_{pl} the wavelength in the plasma, ω_e the electron- and ω_i the ion cyclotron frequency. The frequency of the sounding generator was $\omega = 18.10^7$.

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22770
S/057/61/031/005/001/020
B104/B205

21.2311

AUTHORS: Zavoyskiy, Ye. K., Kovan, I. A., Patrushev, B. I., Rusanov, V. D., and Frank-Kamenetskiy, D. A.

TITLE: Magnetosonic method of plasma ionization

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 5, 1961, 513-517

TEXT: The conventional methods of producing concentrated plasma are discussed in the introduction. It is noted that the application of these methods to a magnetic field is limited. The thermal method can only be used for atoms of low ionization potentials. Ionization by longitudinal current causes instabilities. and ionization by an oscillating electron beam meets with experimental and technical difficulties. The concentration of plasma attainable by h-f discharge is limited by the plasma frequency, and the production of concentrated plasma by a longitudinal alternating field requires the use of millimeter and sub-millimeter waves. The authors tested several methods of obtaining concentrated plasma, which are not limited by the plasma frequency. This is achieved by an alternating electric field, the electric vector of which is perpendicular to a

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Magnetosonic method...

static magnetic field. This method makes it possible to use electron and ion-cyclotron or magnetosonic resonances. The latter method is not limited as to the attainable plasma concentration. It makes use of magnetosonic oscillations of a limited plasma volume, and from the theory of these oscillations it follows that the velocity amplitude of the azimuthal electron drift is given by $v_e = \omega V/\omega_i$ (1), where V denotes the velocity amplitude of the radial plasma motion. For the kinetic electron energy one has

$$E = \frac{mv_e^2}{2} = \frac{1}{2}\frac{\omega^2}{\omega_i\omega_e}\frac{H^2}{4\pi n_e}. \qquad (3)$$

where H_o indicates the strength of the static magnetic field, H the amplitude of the alternating magnetic field, and ω its frequency; ω_e and ω_i are the electron and ion cyclotron frequencies, respectively, and n_e denotes the electron concentrations. Ionization by radial magnetic sound is possible if its energy is higher than the ionization energy. It is obvious that the required amplitudes of the alternating field is the higher, the higher are the concentration and strength of the static field. With a

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Magnetosonic method...

given amplitude of the h-f field $\tilde{H}$ and a given plasma concentration, there exists a threshold H^* of the static field strength above which ionization will not be possible any longer. By increasing the amplitude of the h-f field, the strength of the static field and the attainable plasma concentration can be extended infinitely. In a strong static field, however, a very strong alternating field is required for obtaining high concentrations by radial magnetic sound. Ionization by magnetic sound has been observed experimentally in a quasi-static field in several installations. Effective ionization occurred both below and above the hybrid frequency, resulting in concentrations of more than 10^{13} cm^{-3}. The ionization had the nature of resonance and was always accompanied by the penetration of an alternating field into the plasma. Fig. 1 shows resonance ionization by a h-f magnetic field with an increase of the quasi-static magnetic field in time. By blanking a 3-cm probe signal it was possible to indicate a concentration higher than 10^{12} cm^{-3}. The penetration of an external h-f field was observed by means of a magnetic probe introduced into the discharge space. In fields larger than H^*, concentration dropped considerably. It could be shown that in experiments

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with a quasi-static magnetic field, H^* is a linear function of $\tilde{H}$. This can be explained by formula (3). The calculated values of H^* are somewhat lower than the experimental ones, i.e., ionization can be achieved more easily than would have been expected from the drift. This can be ascribed to longitudinal currents which are due to the fact that the oscillations are not completely radial. Based on these results the authors designed the model of a plasma source with magnetosonic ionization. The plasma comes from the source which is placed in a magnetic field and flows along the field into a measuring volume. In previous experiments, a plasma column having a diameter of 6 cm and a concentration of 10^{12} cm^{-3} was obtained in the measuring volume at a rated power of the ionization generator of 4 kw. The experiments were made above the hybrid frequency, in weak magnetic fields where the drift motion imparts energy to the electrons, which is sufficiently high for ionization. There are 4 figures and 8 references: 7 Soviet-bloc and 1 non-Soviet-bloc. The reference to the English-language publication reads as follows: P. C. Thonemann et al., Nature, 181, 217 1958.

SUBMITTED: July 21, 1960

Magnetoconic method...

Fig. 1: Observations of a 50-Mc discharge in hydrogen; hydrogen pressure of $8 \cdot 10^{-4}$ mm Hg; amplitude of the h-f field in the discharge chamber without plasma: 27 oe; scanning time: 3.5 sec. Legend: I) Oscillogram of the h-f probe signal ($\lambda = 3$cm); II) oscillogram of the magnetic probe emf in the discharge space; III) quasi-static magnetic field.

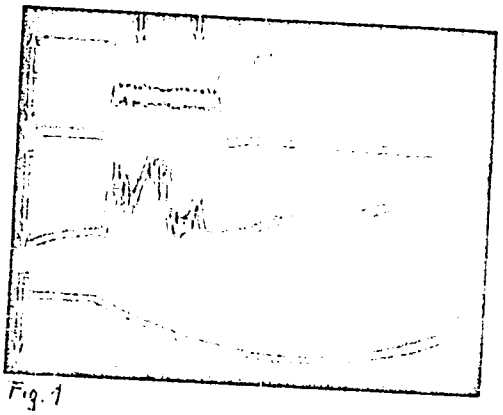

Fig. 1

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AUTHORS: Borodin, A. V., Gavrin, P. P., Kovan, I. A., Patrushev, B. I., Nedoseyev, S. L., Rusanov, V. D., Frank-Kamenetskiy, D. A.

TITLE: Magnetoacoustic oscillations and the instability of an induction pinch

PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 41, no. 2(8), 1961, 317 - 321

TEXT: The results of experiments on a plasma pinch are presented. The experimental arrangement used is schematically shown in Fig.1. A vacuum chamber (10^{-7}mm Hg, 450 - 500°C) made of quartz served as discharge space. Most experiments were performed in air (10^{-1} - 10^{-2}mm Hg), and some of them in hydrogen, argon, xenon, and helium (10^{-1} - 10^{-3}mm Hg). The magnetic field was generated by a homogeneous turn with an inductance of 30 cm, and a 200-kw h-f generator was used for pre-ionization. The

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behaviour of the discharge was studied with the aid of a quick-acting photorecorder, type СФР- 2М(SFR - 2M), and a magnetic probe. The directions of photographing are indicated in Fig.1 Pictures taken in the axial direction show that the incandescene of the gas in the first semiperiod appears in the form of an annular tube. This indicates that the radial oscillations originate from the cold plasma contained in the incandescing tube. Pictures were taken in intervals of 0.3 μsec. The first pinch is attributed to the formation of a relatively weak shock wave. In air with a pressure of 8.10^{-2}mm Hg, the shock wave has a velocity of $2.3.10^{6}$cm/sec and a front width of ~0.7 cm. The discontinuity of the magnetic field at the axis is explained by collisions of strong shock waves. The radial oscillations are ascribed to magnetoacoustic oscillations of the plasma column. The boundary conditions prevailing in this case are analyzed in the following. The analysis is complicated by the fact that the plasma column is copper-shielded. The authors discuss two limiting cases, one of which is based on the assumption that the plasma oscillates as if it were completely enclosed by a copper shield. This assumption was found to be correct. The boundary condition $J_1(kR) = 0$, where $kR \equiv \mu = 1.84, 5.3, \ldots$

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(J - Bessel function), is satisfied here. Using results of Frank-Kamenetskiy the authors obtain the following relation for the frequency of magnetoacoustic oscillations: $f = \mu_{nm} H_o / 2\pi R\sqrt{4\pi M(n_o + n_i)}$, where M is the ion mass, n_i is the ion concentration, and n_o is the concentration of neutral particles. A comparison between experimental and theoretical results obtained for H_2, N_2, and Ar shows that: 1) the dependence of the eigenfrequency on the gas mass is in good agreement with theory; 2) the agreement between the theoretical and experimental absolute values of the frequencies is worse, since many important facts have not been considered. Conclusions: Rapid transverse contraction of plasma results in the occurrence of free magnetoacoustic oscillations of the plasma column, which are damped in time. At the instant of maximum contraction of the annular tube of the plasma, "tongues" protruding along the field are ejected (inertial instability). The excitation of oscillations may be attributed to the rapid contraction of the annular tube without a field. The contraction is caused by shock waves. The tube is formed by the mixing of

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the fields inside and outside the plasma, which have opposite directions. Ye. K. Zavoyskiy is thanked for his interest in the work, and L. I. Rudakov for discussions. There are 6 figures, 1 table, and 10 references: 7 Soviet and 3 non-Soviet.

SUBMITTED: January 27, 1961

Legend to Fig.1: 1) 50-kv rectifier; 2) capacitor bank (27 μf, 50 kv); 3) gap in the turn for photographing; 4) turn for generating the magnetic field; 5) quartz vacuum chamber; 6) and 8) h-f generator; 7) magnetic probe; 9) starter; a) to pump; b) to oscilloscope; c) directions of photographing.

KOVAN, I.A.; PATRUSHEV, B.I.; RUBANOV, V.D.; TILININ, G.N.; FRANK-KAMENETSKIY, D.A.

Effect of spatial amplification of variable magnetic fields in the case of magnetoacoustic resonance in a plasma. Zhur. eksp. i teor. fiz. 43 no.1:16-20 Jl '62. (MIRA 15:9)
(Magnetic fields) (Plasma (Ionized gases))

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Mechanism of slime formation during the condensation of phosphorus from electric furnace gases. Zhur. VKHO 9 no. 2:235-236 '64.
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SOV/112-59-4-7262

8(4)

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 4, p 116 (USSR)

AUTHOR: Patrushev, D. A.

TITLE: Selecting Optimum Electrical Conditions for a Phosphorus Electric Furnace

PERIODICAL: Tr. Ural'skogo n.-i. khim. in-ta, 1957(1958), Nr 5, pp 252-262

ABSTRACT: An ore-type electric furnace is a complicated unit wherein electro-thermal and physico-chemical processes transpire simultaneously. Selection of interelectrode spacing, of the electrode diameter, working voltage, current density, and their influence on the furnace operation are considered. The above parameters are selected on the basis of a comparison of furnace operation abroad with that in the Soviet Union. Charge preparation and the charge influence upon processing are considered. It is mentioned that the best-efficiency furnaces have the ratio of the interelectrode spacing to the electrode diameter equal to 2.5-2.8; however, certain electric-simulation criterion

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Selecting Optimum Electrical Conditions for a Phosphorus Electric Furnace

values should be observed in this case. Furnaces charged with 3-16-mm lump coke, in the amount of 102% of the theoretically needed quantity, show the best performance. The current density for self-sintering electrodes can be assumed 3 amp/cm^2 or higher. Stepping up the voltage cuts the charge processing time in the furnace; however, the furnace is more sensitive to any variation in the charge composition; for this reason, a permanent charge composition must be ensured for operation at higher voltage steps. A higher voltage is associated with a higher dust content of gases which is due to dragout of fine dispersed particles. For this reason, electric gas filters are necessary for running the furnaces at higher voltages.

B.I.I.

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8(4)

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 5, p 115 (USSR)

AUTHOR: Patrushev, D. A.

TITLE: Electric Arc in a Phosphorus Furnace

PERIODICAL: Tr. Ural'skogo n.-i. khim. in-ta, 1957 (1958), Nr 5, pp 281-287

ABSTRACT: Energy distribution between the arc and nonarc heating in an ore-heating furnace has a practical significance for determining optimum conditions. As the process of phosphorus production takes place in the liquid phase, there is no need for the arc. Arc discharge plays a negative role in this process. The presence of an arc in a phosphorus furnace creates individual spots with very high temperatures that are conducive to side reactions. Current and voltage wave distortions served to evaluate the scope of the arc process in the phosphorus vat. Usually, only a part of the current passes through the arc under the electrodes in the furnace. During relatively stable conditions, the voltage and current curve distortions are negligible and the share of arc heating

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Electric Arc in a Phosphorus Furnace

is small. The arc-heating share increases during the starting period, when slag is tapped, during recarbonization, during insufficient charge in the furnace, and also when the voltage on the furnace is being raised. To reduce arcing in a phosphorus furnace, frequent slag tappings should be avoided and accumulation of the excess reducing agent in the furnace working space should not be permitted.

B.I.I.

LEVINA, L.I.; PATRAKOVA, S.N.; PATRUSHEV, D.A.

Dependence of yield and quality of benzene chlorosulfonate on excess of chlorosulfonic acid and additions of sodium salts. Zhur.ob.khim. 28 no.9:2427-2428 S '58. (MIRA 11:11)
(Benzene) (Chlorosulfonic acid) (Sodium salts)