

**1. Extraction of cobalt(II) and zinc ions by the molten mixtures of diantipyrylalkanes and benzoic acid**

By Degtev, M. I.; Alikina, E. N.

From [Russian Journal of Inorganic Chemistry \(2010\), 55\(1\), 133-137](#). Language: English, Database: CAPLUS, DOI:10.1134/S0036023610010237

The extrn. of cobalt(II) and zinc ions with the molten mixts. of diantipyrylalkanes and benzoic acid from thiocyanate solns. was studied. Optimum conditions for phase sepn., the formation of a melt, and the extrn. of the metal ions were detd. The compn. of the extd. complex compds. was found, and the mechanism of extrn. was proposed.

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**2. Concentration of cobalt, zirconium, niobium, hafnium, and tantalum with the assistance of rhodanide diantipyrylmethane complexes**

By Grishchuk, M. E.; Poluyanov, V. O.; Poluyanov, V. P.

From [Vestnik Natsional'noho Tekhnicheskogo Universiteta "KhPI" \(2002\), \(2, 2\), 79-82](#). Language: Ukrainian, Database: CAPLUS

A procedure was described for solvent extrn. of the title metal cations from hydrochloric acid aq. solns. by means of cojoint complexation of thiocyanate and diantipyrylmethane.

**~0 Citings**

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**3. Determination of micro amount of iron in cobalt alloys by double wavelength spectrophotometry**

By Chen, Hua-ping; Li, Shu-wei

From [Sichuan Shifan Daxue Xuebao, Ziran Kexueban \(2000\), 23\(4\), 400-402](#). Language: Chinese, Database: CAPLUS

This paper reports a method of detn. of micro-iron in cobalt alloys by double wavelength spectrophotometry at iso-absorptive point. In pH = 3.0 HCOOH-NaOH buffer soln., diantipyryl methane (DAPM) is used as developer, measuring wavelength is 450 nm and ref. wavelength is 548 nm. The method is simple, rapid and accurate. This method may be also used for the anal. of micro-iron in copper alloys.

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**4. Dual-wavelength spectrophotometric determination of iron and titanium with diantipyrylmethane**

By Yang, Junming

From [Yejin Fenxi \(1994\), 14\(3\), 45-7](#). Language: Chinese, Database: CAPLUS

In dil. HCl soln. Fe<sup>3+</sup> and Ti<sup>4+</sup> reacted with diantipyrylmethane (DAM) to form 2:1 Fe:DAM red and 3:1 Ti:DAM yellow complexes, resp. The absorption max. were 455 and 390 nm for iron and titanium complexes, resp. The isosbestic points were 390 and 510 nm for Fe<sup>3+</sup>-DAM complex. Ti-DAM complex absorbed little at 510 nm. A dual-wavelength spectrophotometric method was developed for simultaneous detn. of iron and titanium in nonferrous base alloys. The method is simple and gives satisfactory results.

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**5. Extraction spectrophotometric determination of microamount of cobalt in nickel as a complex with 1,10-phenanthroline and TBF**

By Ke, Yikan; Cheng, Yi; Liang, Guie

From [Yejin Fenxi \(1990\), 10\(3\), 49-50](#). Language: Chinese, Database: CAPLUS

Microamt. Co was detd. in Ni spectrophotometrically by formation of a ternary complex of Co-di-2-antipyrylmethane-SCN<sup>-</sup> in pH 1-2 CHCl<sub>3</sub> medium followed by extrn. of the org. phase with o-phenanthroline-eosine soln. in pH 7.5 phosphate buffer soln. to form a Co(II)-o-phenanthroline-eosine complex whose absorbance at 537 nm was measured. The compn. of the complex was Co: o-phenanthroline-eosine = 1:2:1. Beer's law was obeyed in the concn. range 1-6 µg Co/10 mL. The molar absorptivity of the complex was 6.85 × 10<sup>4</sup>. The recovery of Co was 90-103%.

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**6. Diantipyrylmethane as complex-forming reagent in the thin-layer chromatographic determination of metals**

By Timerbaev, A.; Shadrin, O.; Zhivopistsev, V.

From *Chromatographia* (1990), 30(7-8), 436-41. Language: English, Database: CAPLUS, DOI:10.1007/BF02328513

The efficiency of **diantipyrylmethane** used as a reagent for the chromatog. sepn. of metals, including titanium, zirconium and hafnium, rare earth elements, transition and platinum-group metals is shown. The peculiarities of the chromatog. behavior of metal **diantipyrylmethanates** and the mechanism of their retention in TLC are discussed. Methods were developed for the detn. of metals based on complex formation directly in the sorbent layer or by liq. extn. The chromatog. sepn. takes place in silica gel thin layers with elution by org. solvent-mineral acid mixts. The metals are detd. by densitometric or spectrophotometric methods after the complexes are isolated from the layer. The procedures are characterized by simplicity, efficiency, and a rather high selectivity. They were used to analyze steels, alloys, industrial solns. and other samples.

## ~2 Citings

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**7. Separation of zinc and cobalt by extraction with **diantipyrylmethane** and their determination**

By Zeng, Huaxian; Zeng, Linru; Chen, Xingguo

From *Lanzhou Daxue Xuebao, Ziran Kexueban* (1988), 24(4), 89-94. Language: Chinese, Database: CAPLUS

An extn. method was developed for sepn. of Zn(II) and Co(II) in the presence of large amts. of Fe, Mn, and Ni. Zn(II) was extd. from HCl solns. with dichloroethane contg. 3% **diantipyrylmethane** (DAM) as (DAM.H)<sub>2</sub>ZnCl<sub>4</sub>, reextd. into aq. soln. with NH<sub>3</sub>-NH<sub>4</sub><sup>+</sup> buffer soln. and detd. spectrophotometrically with Xylenol Orange. Co(II) present in aq. solns. (0.01 N- 1 N acidity) contg. SCN<sup>-</sup> was extd. with CHCl<sub>3</sub> contg. 2% DAM as [DAM.H]<sub>2</sub>[Co(SCN)<sub>4</sub>] and detd. directly by spectrophotometry. The proposed method for the detn. of zinc and **cobalt** is simple, rapid, highly selective, and has been applied to the detn. of zinc and **cobalt** in wastewaters metals, alloys, and minerals with satisfactory results.

## ~0 Citings

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**8. Extraction-photometric determination of **cobalt** in some natural objects**

By Andzhaparidze, D. I.; Toronzhadze, D. D.

From *Izvestiya Akademii Nauk Gruzinskoi SSR, Seriya Khimicheskaya* (1989), 15(1), 29-31. Language: Russian, Database: CAPLUS

Co<sup>2+</sup> forms a complex with SCN<sup>-</sup> and **diantipyrylmethane** (I) in aq. solns. which exts. very well from aq. phase with CHCl<sub>3</sub>. The complex was identified as Q<sub>2</sub>[Co(CNS)<sub>4</sub>] (Q = monoprotonated I) has optical absorption max. at 650 nm in CHCl<sub>3</sub>, and this absorption remains stable for several hours. The optimal conditions for the complex formation involve the presence of 0.5-2N HCl. Increase of the aq. phase vol. >30 mL had neg. effect on the complex absorption in the CHCl<sub>3</sub> ext. The method provides Co<sup>2+</sup> detection range 15-110 µg. The presence of Na<sup>+</sup>, Zn<sup>2+</sup>, Al<sup>3+</sup>, SO<sub>4</sub><sup>2-</sup>, PO<sub>4</sub><sup>3-</sup>, Mg<sup>2+</sup>, Ba<sup>2+</sup>, K<sup>+</sup>, and NH<sub>4</sub><sup>+</sup> did not interfere with Co<sup>2+</sup> detn. This method was used for detn. of Co<sup>2+</sup> on sludge and soil samples.

## ~0 Citings

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**9. Determination of zinc, cadmium, **cobalt**, and copper in electrolytes**

By Sizeneva, I. P.; Kalmykova, I. S.; Amirova, S. A.

From *Zavodskaya Laboratoriya* (1988), 54(3), 26-7. Language: Russian, Database: CAPLUS

The detns. were carried out by peak paper chromatog. by using **diantipyrylmethane** and its hexyl deriv. as pptg. agents. The complexing anions were Cl<sup>-</sup> (for Cd and Zn) and SCN<sup>-</sup> (for Co and Cu).

## ~2 Citings

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**10. Determination of trace iron by dual-wavelength spectrophotometry**

By Qu, Rongian; Xue, Zhongli

From *Fenxi Ceshi Tongbao* (1985), 4(3), 45-8. Language: Chinese, Database: CAPLUS

Trace Fe was detd. in the presence of Co, Cu, or Ni by dual-wavelength spectrophotometry with *diantipyrylmethane* as color reagent at pH 2.2-3.2. The wavelength pairs were selected by K-coeff. method (Honkawa, T., 1976) or equal absorption method to eliminate the interferences. The wavelength pairs used are: 584, 420 nm, in the presence of Co and Cu; 588, 432 nm, in the presence of Co and Ni; 550, 450 nm, in the presence of large amt. of Co.  $\text{Cr}^{6+}$ ,  $\text{V}^{5+}$ , and  $\text{Ti}^{4+}$  interfere in the detn.

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**11. New modification of the thiocyanate method for the determination of cobalt**

By Petrov, B. I.; Rogozhnikov, S. I.; Tarasova, N. N.

From *Zavodskaya Laboratoriya* (1984), 50(9), 9-11. Language: Russian, Database: CAPLUS

Co was detd. in alloys, Ni, and  $\text{NiSO}_4$  by an extn.-photometric method involving sepn. in antipyrine-monochloroacetic acid- $\text{H}_2\text{O}$  systems and measuring the absorbance of the 2:1 antipyrinium ion assoc. with  $\text{Co}(\text{SCN})_4^{2-}$  at 625 nm (molar absorptivity  $1.9 \times 10^3$ ). The optimum pH is 1.5-2.0. *Diantipyrylmethane* can also be used. Fe can be detd. similarly at 440 nm at Fe:Co ratios from 1:4 to 1:50.

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**12. Extraction concentration and spectrochemical determination of controlled elements in acid mine waters**

By Petrov, B. I.; Oshchepkova, A. P.

From *Zhurnal Analiticheskoi Khimii* (1984), 39(9), 1577-80. Language: Russian, Database: CAPLUS

A study of exchange reactions between dithizonates of Co, Ag, Cu, Pb, Zn, Cd, Hg, and Bi and *diantipyrylmethane* (I) salts in nonaq. media indicated that metal ions forming stable thiocyanate or iodide complexes migrate from dithizonates to form anionic complexes and then ion pairs with protonated I. The addn. of salts of I to org. exts. is an effective method of decompn. of dithizonates and preconcn. of elements in a microphase formed by ext. sepn. into 2 phases. A combination of preconcn. of metals in a 3-phase system with at. emission anal. can effectively det. a group of controlled microelements in complex acid mine waters.

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**13. Optimization of conditions for the formation of a mixed-ligand complex of tungsten with o-nitrophenylfluorone and diantipyrylmethane using the steep ascension technique**

By Ivanova, I. F.; Klimkovich, L. L.; Ganago, L. I.

From *Zhurnal Analiticheskoi Khimii* (1984), 39(7), 1259-62. Language: Russian, Database: CAPLUS

W 10-27% was detd. in Co-W magnetic films by extn. of its mixed-ligand complex with *diantipyrylmethane* and o-nitrophenylfluorone from 1.7M HCl into  $\text{CHCl}_3$  and measuring its absorbance at 520 nm (molar absorptivity  $8.8 \times 10^4$ ). The relative error was  $\leq 5\%$ . The exptl. conditions were optimized by using a  $2^{7-3}$  factorial design.

~0 Citings

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**14. Study of the third-order complex formation between cobalt ion, selenocyanate anion and pyrazolone derivatives**

By Hoang, Nham; Le, Ba Thuan

From *Tap Chi Hoa Hoc* (1983), 21(2), 30-2. Language: Vietnamese, Database: CAPLUS

$\text{Co}^{2+}$ - $\text{SeCN}^-$ -L (1:2:1) complexes (L = pyrazolone) and 1:4:2  $\text{Co}^{2+}$ - $\text{SeCN}^{2-}$ -Q complexes (Q = antipyrine, *diantipyrylmethane*, diantipyrylmethylmethane, diantipyrylfurylmethane) were formed and were characterized by visible absorption spectra. Optimum conditions for the formation of these complexes and for their extn. with  $\text{CHCl}_3$  were studied.

## ~0 Citings

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**15. Extraction of microgram amounts of cobalt, iron, cadmium, titanium and manganese from the third phase and spectrophotometric determination of cobalt in pure nickel**

By Zhang, Daokun

From [Fenxi Huaxue \(1983\), 11\(6\), 430-2](#). Language: Chinese, Database: CAPLUS

Trace Co, Fe, Zn, Cd, Ti, and Mn (~20 µg each) in a HCl soln. contg. KSCN and Ni (~100 mg) were quant. extd. into a small-vol. 3rd org. phase after mixing and shaking with a 1:1 C<sub>6</sub>H<sub>6</sub>-CHCl<sub>3</sub> contg. [diantipyrylmethane](#) (I) while Ni remained in the aq. phase. The extn. thus provided a simple means of spectrophotometric detn. of trace Co in pure Ni. A pure Ni sample (0.100 g, contg. Co 0.0042%) was dissolved in HNO<sub>3</sub>, the soln. was evapd. to dryness, 1.65 mL HCl, 8.4 mL H<sub>2</sub>O (to give a 1N HCl concn.), and 0.1 g NH<sub>4</sub>F were added; the soln. was mixed with 10 mL 2N KSCN and 10 mL 1:1 C<sub>6</sub>H<sub>6</sub>-CHCl<sub>3</sub> (contg. 0.5 g I). The mixt. was shaken for 7 min, the 3rd org. phase was sepd. and added to 5 mL CHCl<sub>3</sub>; the soln. was extd. with 5 mL 10% NaOAc soln., mixed with 10% Na citrate 2, 0.02% PAR 1, and 0.5% EDTA 2 mL, and the Co concn. detd. spectrophotometrically at 510 nm to be 0.0044%.

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**16. Photothermographic photosensitive materials**

No Inventor data available

From [Jpn. Kokai Tokkyo Koho \(1982\), JP 57040253 A 19820305](#), Language: Japanese, Database: CAPLUS

A photothermog. material is composed of (1) a support; (2) a base-releasing layer contg. Co(III) ammine (or amine) complex, a quinone compds., a reducing agent, and a chelating agent; (3) an intermediate layer prepd. from an aq. soln. or emulsion type resin; and (4) a coloration layer contg. an aminotriarylmethane deriv. type color-former, a coloration promoting acid, a hexarylbiimidazole type photooxidizing agent, and an epoxy compd. The addn. of epoxy compd. improves the photofixing sensitivity of the photothermog. materials. Thus, a polyester film support was coated with a compn. contg. poly(vinyl butyral), tris(ethylenediamine)cobalt triperchlorate, 1,6-pyrenequinone, 1,8-pyrenequinone, 9,10-phenanthrenequinone, [diantipyrylmethane](#), p-toluenesulfonic acid, and N-bromosuccinimide. Then, a poly(vinyl acetate) emulsion was used to form an intermediate layer, on which a compn. contg. poly(vinyl butyral), tris(4-diethylamino-2-methylphenyl)methane, 2,2'-bis(2-chlorophenyl)-4,4',5,5'-tetraphenylbiimidazole, maleic acid, silica, and Epikote 1000 to give a photothermog. film.

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**17. Photothermographic films**

No Inventor data available

From [Jpn. Kokai Tokkyo Koho \(1982\), JP 57035851 A 19820226](#), Language: Japanese, Database: CAPLUS

Photothermog. photosensitive materials contain (1) a Co(III) ammine (or amine) complex, (2) a redox couple composed of a H donor and a polycyclic quinone ( $\lambda_{\text{max}}$  at 400-550 nm), (3) a chelating agent whose Co complex shows little absorption of visible light, (4) a UV-sensitive acid-forming agent, and (5) a dye precursor which forms a dye upon reaction with an acid. Thus, a film support was coated with a compn. contg. poly(vinyl butyral), tris(ethylenediamine)cobalt triperchlorate, 1,6-pyrenequinone, 1,8-pyrenequinone, 9,10-phenanthrenequinone, [diantipyrylmethane](#), 1,3,3-trimethylindolino-7'-diethylaminobenzospiropyran, hexabromodimethyl sulfone, triethanolamine triacetate, and silica to give a photothermog. film which gave pos. redish purple images.

## ~0 Citings

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**18. Mixed-ligand complexes of some transition elements with [diantipyrylmethane](#) and salicylic acid**

By Zanin, V. V.; Ponomarev, V. D.; Petrov, B. I.

From [Organ. Reagenty v Analit. Khimii, Perm \(1981\), \(4\), 40-7](#). Language: Russian, Database: CAPLUS

Title only translated.

## ~0 Citings

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## 19. Chemical spectral determination of heavy metals in mine waters

By Petrov, B. I.; Oshchepkova, A. P.; Zhivopistsev, V. P.; Nemkovskii, B. B.  
From *Khimiya i Tekhnologiya Vody* (1981), 3(6), 522-4. Language: Russian, Database: CAPLUS

The spectral method det. Cu, Lu, V, Sn, Ga, Mo, Nb, Bi, W, Co, Cd, and Sb in mine water contg. 0.2-5.0 mg Fe/L by extrn. concn. using a 0.05M soln. of **diantipyrylmethane** [1251-85-0] in  $\text{CHCl}_3$  or dichloroethane in the presence of  $\text{H}_2\text{SO}_4$  and  $\text{NH}_4\text{CNS}$ . The extrn. effectiveness is 95%. The detn. accuracy is fairly satisfactory. Ni, Al, and Mn do not interfere with the detn. The detn. procedure is based on the method of 3 stds.

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## 20. Use of thiocyanate-diantipyrylmethane complexes for preconcentration

By Moroshkina, T. M.; Serbina, A. M.; Petrova, G. A.; Sadkovskaya, I. I.  
From *Zhurnal Analiticheskoi Khimii* (1979), 34(5), 872-5. Language: Russian, Database: CAPLUS

A method is described for the extrn. preconcn. of Ca, Nb, Ta, Zr, and Hf into a 3d phase as thiocyanate-**diantipyrylmethane** complexes. A sensitive spectrog. method is suggested for the detn. of Co, Zr, Hf, Nb, and Ta in high-alloy steel. The limits of detection are  $1 \times 10^{-7}$  g for Zr and Hf,  $1 \times 10^{-6}$  g Ta, and  $(2-8) \times 10^{-8}$  g for Co and Nb. The relative std. deviation is  $\leq 0.05$  and for Nb  $\leq 0.13$ .

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## 21. Synthesis and physicochemical study of "onium" salts of iron(II), iron(III), and cobalt(III) cyanide complexes with diantipyrylmethane

By Mikhalevich, K. N.; Kuntzi, O. I.; Semenishin, D. I.  
From *Koordinatsionnaya Khimiya* (1978), 4(11), 1695-8. Language: Russian, Database: CAPLUS

EtOH solns. of **diantipyrylmethane** (L) reacted with aq. solns. of  $\text{H}_4[\text{Fe}(\text{CN})_6]$ ,  $\text{H}_3[\text{Fe}(\text{CN})_6]$ ,  $\text{H}_3[\text{Co}(\text{CN})_6]$ , and  $\text{H}_2[\text{Fe}(\text{CN})_5\text{NO}]$  to give  $(\text{HL})_2\text{H}_2[\text{Fe}(\text{CN})_6] \cdot 3\text{H}_2\text{O}$  (I),  $(\text{HL})_2\text{H}[\text{Fe}(\text{CN})_6] \cdot 3\text{H}_2\text{O}$  (II),  $(\text{HL})_2\text{H}[\text{Co}(\text{CN})_6] \cdot 3\text{H}_2\text{O}$  (III), and  $(\text{HL})_2[\text{Fe}(\text{CN})_5\text{NO}]$  (IV). The complexes were characterized by x-ray diffraction, IR spectra, and thermogravimetry. I and II decompd. thermally at 100-280 and 80-240°, resp., to  $\text{Fe}_2[\text{Fe}(\text{CN})_6]$ ; III at 80-280° to  $\text{Co}[\text{Co}(\text{CN})_6]$ ; and IV to  $\text{Fe}[\text{Fe}(\text{CN})_6]$  at 195-220°.

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## 22. Complex formation and extraction of elements with diantipyrylmethanes from trichloroacetate solutions

By Petrov, B. I.; Vilisov, V. N.  
From *Zhurnal Analiticheskoi Khimii* (1976), 31(12), 2298-301. Language: Russian, Database: CAPLUS

Hg(II), Sc(III), Ti(III), Zr(IV), Hf(IV), Fe(III), Th(IV), and Pd(II) were extd. quant.; Ga(III), Ce(III), La(III), Cu(II), Pb(II), Co(II), Ag(I) were  $\leq 20\%$  extd.; Zn(II), Cd(II), Mn(II), Cr(III), V(IV), Ti(I), and Fe(II) were not extd. at all. Sc extrn. with **diantipyrylmethane** (I) was studied more specifically, and a method is presented for the detn. of Sc. Complete Sc extrn. with I took place between pH 5 and 0.3N  $\text{H}_2\text{SO}_4$ . A 30-fold excess  $\text{CCl}_3\text{COO}^-$  and a 10-fold excess I were needed. The distribution coeff. remained const. for  $1 \times 10^{-4}$ - $1 \times 10^{-2}$  M Sc. Independent of the aq. phase acidity, metal ions were extd. via the addn. mechanism at pH  $< 3$  and by cationic exchange at pH  $> 3$ . In both cases the Sc/I molar ratio was 1:2. The compn. of the ion assoc. formed by Sc is  $[\text{ScI}_2(\text{CCl}_3\text{COO})_2]\text{CCl}_3\text{COO}$ . In, Zr, Hf, and Fe(III) behave in a similar manner. Rare earth elements, Fe(II), Zn, Cd, Ni, Al, V(IV), Mn(II), and alkali and alk. earth elements do not interfere in the Sc detn.

~0 Citings

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## 23. Comparative evaluation of diantipyrylmethanes in a chloride system illustrated by the extraction of cobalt



By Petrov, B. I.; Degtev, M. I.; Zhivopistsev, V. P.

From [Tr. Estestvennonauch. In-ta pri Perm. Un-te \(1975\), 13\(3\), 234-9](#). Language: Russian, Database: CAPLUS

Title only translated.

~0 Citings

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## 24. Complexing of 2,3-quinoxalinedithiol with cobalt ions and organic bases

By Pilipenko, A. T.; Ryabushko, O. P.; Krivokhizhina, L. A.

From [Ukrainskii Khimicheskii Zhurnal \(Russian Edition\) \(1976\), 42\(10\), 1077-81](#). Language: Russian, Database: CAPLUS

CHCl<sub>3</sub> exts. 1:3:3 complexes of Co<sup>2+</sup> with 2,3-quinoxalinedithiol and the org. bases pyridine, antipyrine, amidopyrine, [diantipyrylmethane](#), Bu<sub>4</sub>N<sup>+</sup>, Ph<sub>4</sub>As<sup>+</sup>, Ph<sub>4</sub>P<sup>+</sup>, and diphenylguanidine; the latter was effective over a wide range of pH. The absorption max. of the ext. is 520 nm in acid soln. and 490 nm in basic. This extn. is suggested as a possible anal. method.

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## 25. Comparative characteristics of photometric methods for determining the sum of rare earth elements in mineral raw material

By Dolgorev, A. V.; Lysak, Ya. G.

From [Dostizh. Razvit. Nov. Metodov Khim. Anal. \(1974\), 4-5](#). Language: Russian, Database: CAPLUS

The total rare earth concn. in minerals was detd. spectrophotometrically with Arsenazo II or Antipyrine S after the seprn. of interfering ions by extn. with [diantipyrylmethane](#) (I) in CHCl<sub>3</sub> from SCN<sup>-</sup> solns. The influence of both I and SCN<sup>-</sup> concns., pH, ratio of phases, duration of extn., and the order of addn. of the reagents was studied. Fe 50 mg, 10 mg Ti, V, Cd, Zn, Cu, Co, Mo, and W; 5 mg Th, U, Zr, Nb, Ta, In, Sb, Tl, and Au; and 1 mg Be and Sc were extd. quant.; only 1-3% of rare earth elements were coextd. The sensitivity was 5 × 10<sup>-4</sup>% for 1 g of the sample.

~0 Citings

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## 26. Use of [diantipyrylmethane](#) for determination of cobalt and manganese in enamels and dyes

By Romanova, V. S.

From [Tr. Ural'sk. Nil chern. met. \(1974\), \(21\), 100-1](#). Language: Russian, Database: CAPLUS

Title only translated.

~0 Citings

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## 27. Extraction of cobalt thiocyanate compounds with organic bases

By Tananaiko, M. M.; Mirzoyan, F. V.

From [Ukrainskii Khimicheskii Zhurnal \(Russian Edition\) \(1972\), 38\(6\), 610-16](#). Language: Russian, Database: CAPLUS

[Diantipyrylmethane](#) (Dapm) and antipyrine (Ap) are recommended as the most suitable of the 12 bases studied for the extractive detn. of Co. They form CHCl<sub>3</sub>-sol. complexes at pH 3-4 of formulas (DapmH)<sub>2</sub>Co(SCN)<sub>4</sub> and (Ap<sub>2</sub>H)<sub>2</sub>Co(SCN)<sub>4</sub>, resp. These absorb at 625 nm and the extn. const. for Dapm is log k = 5.49 ± 0.04. The const. for diphenylguanidine, (PhCH<sub>2</sub>)<sub>3</sub>N, quinoline, and Bu<sub>3</sub>N are much smaller. The complex with (PhCH<sub>2</sub>)<sub>3</sub>N has the formula [(PhCH<sub>2</sub>)<sub>3</sub>NH]<sub>2</sub>Co(SCN)<sub>4</sub>·(PhCH<sub>2</sub>)<sub>3</sub>NHSCN. Bu<sub>3</sub>N and Am<sub>3</sub>N form, over a wide range of pH, complexes of the type (R<sub>3</sub>N)<sub>2</sub>Co(SCN)<sub>4</sub> which can be extd. by CHCl<sub>3</sub>.

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**28. Effect of nonaqueous solvents on complexing in the cobalt-thiocyanate-organic base system**

By Tananaiko, M. M.; Mirzoyan, F. V.

From *Izvestiya Vysshikh Uchebnykh Zavedenii, Khimiya i Khimicheskaya Tekhnologiya* (1971), 14(7), 975-9.

Language: Russian, Database: CAPLUS

Data are given for the formation and extn. of complexes of the type (org. base-H)<sub>2</sub>Co(NCS)<sub>4</sub> where the org. bases are: diphenylguanidine (I), quinoline (II), antipyrine (III), diantipyrylmethane (IV), pyramidone (V), Bu<sub>3</sub>N, and triamylamine. The optimum extractants are MeCl and (CH<sub>2</sub>Cl)<sub>2</sub>. PhH, PhMe, and CCl<sub>4</sub> do not ext. the complex. High mol. wt. alcs. and ketones form intensely colored compds. with the bases and Co(NCS)<sub>4</sub><sup>2-</sup>. The addn. of MeOH to CHCl<sub>3</sub> used for extn. of the compd. results in its dissocn. In CHCl<sub>3</sub>-MeOH mixts. and in Me<sub>2</sub>CO solns., the strength of the Co(NCS)<sub>4</sub> bond increases with the org. base used in following series: I < NH<sub>4</sub><sup>+</sup> = III = II < IV < V.

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**29. Concentration of the by-products of radiochemical research and removal of radioactive elements from waste waters using diantipyrylmethane**

By Zhivopistsev, V. P.; Petrov, B. I.; Ponomov, I. N.

From *Radiokhimiya* (1970), 12(4), 631-5. Language: Russian, Database: CAPLUS

Radioactive Co present in various waste solns. may be removed from the soln. by the addn. (to 1-2 l. of the soln.) of NH<sub>4</sub>SCN (to a concn. of 1-2%) and of 10 ml of a 20% soln. of diantipyrylmethane (before the addns., the soln. must be acidified with a small amt. of HCl or H<sub>2</sub>SO<sub>4</sub>); after shaking, the org. layer (contg. the Co, as well as Zn, Fe, Sn, Zr, and Mo, which are also extd.) is sepd. and the extn. is repeated with fresh extractant. The 2-step extn. results in quant. recovery of the Co; the Co may be back-extd. with 5% NH<sub>4</sub>OH, or a Co salt may be isolated by evapn. of the org. extract to dryness, ignition of the residue, and dissoln. of the product in a mineral acid.

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**30. Isolation and extraction-photometric determination of cobalt in nickel in the form of a ternary complex: cobalt-diantipyrylmethane-thiocyanate**

By Adamiec, Izabella

From *Chemia Analityczna (Warsaw, Poland)* (1969), 14(1), 115-23. Language: Polish, Database: CAPLUS

Dissolve 1-5 g. Ni contg. 0.001-0.05% Co in 15 ml. 3:2 HNO<sub>3</sub> and evap. twice with 5 ml. concd. HCl. Add to the residue 5 ml. 5N H<sub>2</sub>SO<sub>4</sub> and 10 ml. H<sub>2</sub>O, bring to the boil, cool, add 10 ml. 10% ascorbic acid (to mask Fe(III) and Cu(II)), 5 ml. 40% NH<sub>4</sub>SCN, and dil. to 50 ml. Ext. the soln. twice with 5 ml. 2% diantipyrylmethane in CHCl<sub>3</sub>. Add to the combined exts. 2 ml. H<sub>2</sub>SO<sub>4</sub> (d. 1.83), evap., and oxidize org. matter with HNO<sub>3</sub> (d. 1.4). Treat the residue with 3 ml. N HCl and 10 ml. H<sub>2</sub>O and boil. After cooling add 3 ml. 50% NaOAc, 5 ml. 0.2% nitroso-R salt, and 5 ml. 1:1 HNO<sub>3</sub>, and bring to the boil. After cooling measure the absorbance at 550 mμ. In the detn. of Co contents >0.05% (0.05-0.70%) measure directly the absorbance of the CHCl<sub>3</sub> ext. of the ternary complex at 620 mμ; molar absorptivity is 3.6 × 10<sup>3</sup>.

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**31. Use of hexyldiantipyrylmethane in inorganic analysis**

By Zhivopistsev, V. P.; Petrov, B. I.

From *Uch. Zap. Permsk. Gos. Univ.* (1964), No. 111, 170-5. Language: Russian, Database: CAPLUS

A comparative study was made of hexyldiantipyrylmethane (I) and diantipyrylmethane (II) for extn. of metals from 6N HCl. CHCl<sub>3</sub> and CH<sub>2</sub>Cl<sub>2</sub> were used as solvents for I and II. Extn. of Zn, Cd, Cu<sup>++</sup>, Cu<sup>+</sup>, Mn<sup>++</sup>, Co, Ni, Fe<sup>3+</sup>, Zr, Th, Pb, Cr<sup>3+</sup>, and Mg was studied. For all metals (except Mg and Cr which were not extd. by either reagent) extn. with I gave higher yields than extn. with II. Extn. with I was higher by using CH<sub>2</sub>Cl<sub>2</sub> instead of CHCl<sub>3</sub>. A method for detn. of Co in the presence of Ni with the aid of I was developed and the procedure for analysis of mixts. of Fe, Cu, Co, and Ni with I and II are given.

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**32. The solubility of cobalt thiocyanate diantipyrylmethane and conditions for obtaining analytical concentrates of cobalt**

By Babko, A. K.; Danilova, V. N.

From *Zhurnal Analiticheskoi Khimii* (1965), 20(12), 1341-6. Language: Russian, Database: CAPLUS

The soly. of diantipyrylmethane (DM) thiocyanate (SCN) in 0.5N HCl at various concns. of SCN<sup>-</sup> and at an ionic strength,  $\mu = 1$  was studied. The soly. product of DMSCN is  $[DM^+][SCN^-] = (0.9 \pm 0.4) \cdot 10^{-4}$ . The soly. product of  $(DM)_2CO(SCN)_4$  in 0.5N HCl in the presence of SCN<sup>-</sup> at  $\mu = 1$  is const. and equal to  $[DM^+]^2[Co(SCN)_2][SCN^-]^2 = (2.0 \pm 0.8) \times 10^{-14}$ . Optimum concns. of SCN and DM ions for Co pptn. are limited by the value of the DMSCN soly. product, which is the limit of the total ion excess. Co concn. can be decreased not lower than to  $2.5 \times 10^{-6}M$ . Co can be extd. more completely only by copptn. and extn. The higher effectiveness of Co extn. with  $CHCl_3$  can be explained by the high soly. of the Co-DMSCN complex in  $CHCl_3$ .

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**33. Sequential separation and determination of some elements with the aid of diantipyrylmethane. II. Separation and determination of iron, copper, and cobalt**

By Zhivopistsev, V. P.; Aitova, V. Kh.; Selezneva, E. A.

From *Izvestiya Vysshikh Uchebnykh Zavedenii, Khimiya i Khimicheskaya Tekhnologiya* (1963), 6(6), 909-12.

Language: Unavailable, Database: CAPLUS

cf. CA 60, 8611g. A new method is described for the sepn. and detn. of Fe, Cu, and Co which is applicable to analysis of alloys contg. moderate to high concns. of these elements. The method is based on the high specificity for extn. of Cl<sup>-</sup> and SCN<sup>-</sup> complexes of the elements with diantipyrylmethane (I) in  $CHCl_3$ . From a soln. of the alloy in strong HCl, only Fe is extd. by I in  $CHCl_3$  as a complex between I and  $H(FeCl_4)$ . Fe is titrated with Trilon B after re-extn. by  $H_2O$ . Little or no  $Cu^{++}$  is extd. with the Fe, but  $Cu^+$  may be removed from a portion of the Cl<sup>-</sup> soln., from which the Fe has been extd., by again extg. with I in  $CHCl_3$  after the addn. of ascorbic acid for redn. to  $Cu^+$ . Co may be extd. from another portion of this soln., after adding  $NH_4SCN$  to form a thiocyanate complex, by I in  $CHCl_3$ . Both  $Cu^+$  and Co are titrated in aq. soln. with Trilon B.

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**34. Spectrophotometric investigation of analytically significant reactions. III. Complex compounds formed in acetone solutions by cobaltous ions in the presence of nitrate and diantipyrylmethane**

By Tolmachev, V. N.; Serpukhova, L. N.; Samoilov, V. P.

From *Uchenye Zapiski Khar'kov. Univ.* (1956), 76, 73-82. Language: Unavailable, Database: CAPLUS

cf. CA 48, 9256e; 54, 8407d. The equil. established when diantipyrylmethane (I), cobaltous, thiocyanate, or nitrate ions are mixed in  $Me_2CO$  solns. were investigated spectrophotometrically. It was shown that the absorption spectra of  $Me_2CO$  solns., contg. I and  $Co^{++}$  and  $CNS^-$ , are detd. by the properties of  $Co(CNS)_4^-$ . By studying the systems  $Co(NO_3)_2-LiNO_3$  by the method of continued change, the compn. of the nitrate complex of Co and the const. of its formation were detd. The complex is  $Co(NO_3)_3^-$ . Its formation const. is  $(4.5 \pm 3.9) \times 10^8$ . Investigation of the system  $Co(NO_3)_3^-$ -I in  $Me_2CO$  established the formation of a complex ion,  $[Co(NO_3)_3I_2]$ . The dissocn. const. of this ion is  $5.3 \times 10^{-15}$ . It was assumed that the investigated complex ion belonged to the group of "electrostatic ions." From Referat. Zhur., Khim. 1958, Abstr. No. 35670.

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**35. Photocolorimetric method for the determination of cobalt in steel**

By Ugol'nikov, N. A.; Kirsas, V. S.

From *Trudy Tomsk. Gosudarst. Univ. im. V. V. Kuibysheva, Ser. Khim.* (1957), 145(5-ya Nauch. Konf. 1954), 63-6.

Language: Unavailable, Database: CAPLUS

A rapid method for the detn. of small amts. of Co in the presence of Ni involves extg. the complex compd., formed by Co with diantipyrylmethane in the presence of thiocyanate, with  $CHCl_3$  to obtain a yellow soln. that is suitable for colorimetry.  $V^{5+}$ ,  $Mo^{4+}$ , and  $Mo^{6+}$  interfere, as they form  $CHCl_3$ -sol. complexes, but  $Ni^{++}$ ,  $Cr^{+++}$ ,  $Mn^{++}$ ,  $Fe^{+++}$ , and  $V^{4+}$  do not interfere. The  $HNO_3$  soln. of a Cr steel was treated with  $NH_4CNS$  and NaF to decomp. the  $Fe(SCN)_3$  complex. After addn. of diantipyrylmethane, the complex  $(C_{23}H_{21}O_2N_4)_2H_2 \cdot [Co(CNS)_4]$  was extd. and colorimetrically detd. Amts. of 0.1-1.25% Co could be detd. in steel contg. up to 20% Ni.



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**36. Photometric determination of cobalt with pyrazolone derivatives**

By Sokolova, E. V.; Pesis, A. S.; Panova, N. I.

From *Zhurnal Analiticheskoi Khimii* (1957), 12, 507-12. Language: English, Database: CAPLUS

See C.A. 52, 1844b.

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**37. Detection of cobalt**

By Bagdasarov, K. N.; Kovalenko, P. N.; Mel'nikova, S. S.

From *Zhurnal Analiticheskoi Khimii* (1957), 12, 587-8. Language: English, Database: CAPLUS

See C.A. 52, 1844a.

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**38. Study of the structure, stability, and absorption spectra for complexes formed in acetone by cobalt ions with nitrate ions and with diantipyrylmethane**

By Tolmachev, V. N.; Serpukhova, L. N.; Samoilov, V. P.

From *Zhurnal Neorganicheskoi Khimii* (1957), 2, 2078-84. Language: Unavailable, Database: CAPLUS

The reaction between  $\text{Co}^{++}$ ,  $\text{NO}_3^-$ , and diantipyrylmethane (Dp) was studied in an acetone medium. The compn. of the complex ions was detd. as  $\text{Co}(\text{NO}_3)_3^-$  and  $\text{Co}(\text{NO}_3)_3\text{Dp}_2^-$ ; their formation consts. are  $2.7 \times 10^3$  and  $4.1 \times 10^5$ , resp. The absorption spectra of these solns. were studied. It was found that the displacement of  $\text{Me}_2\text{CO}$  mol. from the solvate shell of  $\text{Co}^{++}$  by  $\text{NO}_3^-$  and then by Dp displaces the spectrum toward lower frequencies and increases the intensity of the absorption.

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**39. Photometric determination of cobalt with pyrazolone derivatives**

By Sokolova, E. V.; Pesis, A. S.; Panova, N. I.

From *Zhurnal Analiticheskoi Khimii* (1957), 12, 489-94. Language: Unavailable, Database: CAPLUS

$\text{Co}^{++}$  was combined with  $\text{SCN}^-$  and a diantipyrylmethane deriv. (methyl, propyl, phenyl, p-tolyl, p-hydroxyphenyl, o-hydroxyphenyl, or dimethyl-p-aminophenyl-); the blue-colored complex was extd. with  $\text{CHCl}_3$  and detd. photometrically. To det. Co in 2 ml. of  $\text{CoCl}_2$  soln. contg. 0.05 mg./ml. Co, the preferred conditions were: satd.  $\text{NH}_4\text{SCN}$  soln. 0.5 ml., 0.1N  $\text{H}_2\text{SO}_4$  of the reagents propyl, tolyl, and aminophenyl derivs. 0.5 and the rest 1.0 ml., 1% reagent soln. 0.8-2 ml.,  $\text{H}_2\text{O}$  (some required  $\text{H}_2\text{O}$  and  $\text{CHCl}_3$ ) 2 ml. Of the reagents tested diantipyrylmethane and the methyl, o-hydroxyphenyl, and p-hydroxyphenyl derivs. were the most sensitive (7.5  $\gamma$ /ml. Co).

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**40. Detection of cobalt**

By Bagdasarov, K. N.; Kovalenko, P. N.; Mel'nikova, S. S.

From *Zhurnal Analiticheskoi Khimii* (1957), 12, 564-5. Language: Unavailable, Database: CAPLUS

When Co reacts with thiourea or thiosulfate in the absence of  $\text{H}_2\text{O}$ , a blue color appears. The color disappears upon addn. of  $\text{H}_2\text{O}$ . The appearance of the blue color is attributed to the dehydrating action of  $\text{CH}_4\text{N}_2\text{S}$ ,  $\text{S}_2\text{O}_3^{--}$ , or other suitable substance, thus exposing the blue color of anhyd. Co salts.

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