ЎЗБЕКИСТОН РЕСПУБЛИКАСИ ОЛИЙ ВА ЎРТА МАХСУС ТАЪЛИМ ВАЗИРЛИГИ

**АЛ-ХОРАЗМИЙ НОМИДАГИ
УРГАНЧ ДАВЛАТ УНИВЕРСИТЕТИ**

Қўлёзма ҳуқуқида
УДК 546.722.723:547.826.7:547-327

АБДУЛЛАЕВА ЗУБАЙДА ШАВКАТОВНА

ТЕМИР (II) ВА ТЕМИР (III) САЛИЦИЛАТЛАРИНИНГ ТУРЛИ АМИДЛИ КООРДИНАЦИОН БИРИКМАЛАРИ

5А140501-Ноорганик кимё

**Магистр
академик даражасини олиш учун ёзилган**

Д И С С Е Р Т А Ц И Я

Илмий раҳбар:
доц. Ш.Б. Ҳасанов

«____» ___________ 2016 й.

____

УРГАНЧ – 2016 й.

ʃ ʀɿ ʀʜʊɽʈʜʊɺʃ ɺʒ ʜʐ ɽɺʃ ʀ ʜʈɽɽɿɽɺʃ ʜɬ ɽʎʀɸʃ ʔɿʃ ɺʃ
ʃ ɹʈɸɿʃ ɺɸɿ ʀɕ ʈɽʜɬ ʋɹʃ ʀʂʀ ʋɿɹɽʂ ʀʜʊɸɿ

ʋʈɺɽɿ ʏʜʂʀʙ ɺʃ ʜʋɽɸʈʜʊɺɽɿɿʒ ʙ ʋɿ ʀɺɽʈʜʀʊɽʊ
ʀʃ ɽɿʀ ɸʃ ʔ-ʍʃ ʈɽɿʃ ʀ

ɿ ʘʈʈɐʘɘʘ ʈɐʦʈʃɕʃ
ʋɽʂ *546.722.723:547.826.7:547-327*

ɸɹɽʋʃ ʃ ɸɽɺɸ ɿʋɹɸʙɽɸʐ ɸɺʂ ɸʊʃ ɺɿ ɸ

ʈɸɿɿʃ ɸʃ ʀɽɿʒ ɽ ʂʃʃ ʈɽʀɿ ɸʎʀʃ ɿɿʒ ɽ ʜʃ ɽɽʀɿɽɿʀɕ
ʜɸʃ ʀʎʀʃ ɸʊʃ ɺ ɾ ɽʃ ɽɿɸ (II) ʀ ɾ ɽʃ ɽɿɸ (III)

ɽ ʀ ʜ ʜ ɽ ʈ ʊ ɸ ʎ ʀ ɕ

ʥʘʩʂɕʩ ʘʥʝ ʘ ʘʝ ʥʒɕʯʩ ʦ ʩʝ ʧʝ ʥʃ ʥʘʕɕʩʂʈɐʘ

5ɸ 140501 ɿ ʝʦʈɐʘʥʃʯ ʩʘ ʕɕʥɕ

ɿ ʘʐʯɕʥ ʝ ʈʥʦʦɘʦʜɕʃʝʥɕ:

ʜʦʯ. ʐ .ɹ. ʍʘʩʘʥʦɘ

«_____» ___________ 2016 ɕ.

____

ʋʈɺɽɿ ʏ ï 2016 ɕ.

[illegible]

[illegible]

[illegible] [illegible] [illegible]

[illegible] [illegible]

[illegible] 2014-2016 [illegible]

[illegible] «[illegible] (II) [illegible] (III)»

[illegible] [illegible] (o-[illegible]) [illegible] o-HOC_6H_4COOH [illegible]

[illegible]

[illegible]

[illegible] : [illegible]

[illegible] :

[illegible]:

- [illegible] Fe(II) [illegible] Fe (III) [illegible]
- [illegible]
- [illegible] Fe(II) [illegible] Fe (III) [illegible];
- [illegible].

[illegible]: [illegible] Fe(II) [illegible] Fe (III), [illegible].

[illegible] Fe(II) [illegible] Fe (III), [illegible]

[illegible]

[illegible] 12 [illegible] Fe(II) [illegible] Fe (III) [illegible]

[illegible]

[illegible]

[illegible]

[illegible] Fe(II) [illegible] Fe (III) [illegible]

[illegible]

[illegible] «5140500 [illegible]».

[illegible] : [illegible].

[illegible] : [illegible] 1 [illegible].

[illegible] : [illegible] 12 [illegible] Fe(II) [illegible] Fe (III). [illegible].

[illegible] : ______________________

([illegible])

[illegible] ______________________

([illegible])

O`ZBɽKISTON Rɽ SPUBLIKASI
OLIY VA O`RTA MAXSUS TA'LIM VAZIRLIGI

URGANCH DAVLAT UNIVERSITETI

Fakultet Tabiiy fanlar________ Magistratura talabasi _Abdullayeva Z.Sh.
Kafedra Kimyo Ilmiy rahbar ____Hasanov Sh.B.
O`quv yili ____2014-2016________ Mutaxassisligi__Noorganik kimyo____

Urganch davlat universiteti kimyo kafedrasi magistranti Abdullayeva Zubayda Shavkatovnaning ñTemir (II) va temir (III) salitsilatlarining turli amidli koordinatsion birikmalariò mavzusidagi

MAGISTRLIK DISSERTATSIYASIGA ANNOTATSIYA

Mavzuning dolzarbligi: Biologik faollikka ega birikmalar tadqiqotchilarda katta qiziqish uygôotadi. Ularga salitsil kislota o-HOC_6H_4COOH ham kiradi, katta amaliy ahamiyatga ega boðlgan muhim oksiaromatik kislotalardan birisi. Ushbu kislota sanoatda antiseptiklar, dezinfeksiyalovchi moddalar, antirevmatik va bezgakka qarshi vositalar ishlab chiqarishda ishlatiladi. Salitsil kislota nazariy jihatdan ham qiziqish uygôotadi. Ushbu kislota ï aralash funksiyali birikma, chunki unda ham fenol, ham karboksil guruhlar boðladi. Ular bir-biriga nisbatan orto holatda joylashadi, bu esa metallar bilan ichki kompleks hosil qilishiga imkon beradi, ularning ahamiyati esa umumiy va analitik kimyoda oshib bormoqda.

Amidlar ambident molekulalar boðlib, ular tarkibida kislorod va azotning elektronodonor atomlari, tiokarbamidda esa oltingugurt va azot atomlari mavjud. Amidlar, tiokarbamid va salitsil kislotaning koordinatsiya markazlarini aniqlash esa katta qiziqish uygôotadi.

Shuningdek, amidlar va atsetat, oleat, palmitat tuzlarini turli ligandli koordinatsion birikmalari koðpchilik mualliflar tomonidan oðrganilgan. Sintez qilingan birikmalar ichida biologik faollikka ega moddalar aniqlangan. Ayrim birikmalar gôoôzani oôsishi va rivojlanishini stimulyatori boôlishi aniqlangan.

Ishning maqsadi: amidlar, tioamid va nikotinamidning temir salitsilatlari bilan koordinatsion birikmalarini hosil boôlish sharoitlarini aniqlash, tarkibi va tuzilishini isbotlash; ularning tarkibini tuzilishi va termik xossalariga taôsirini oôrganish, hamda komplekslar xossalarini tuzilishi va tarkibiga bogôliqligini aniqlash.

Ishning vazifalari:

Qoôyilgan maqsadga erishish uchun quyidagi vazifalarni yechish kerak edi:

- Fe(II) va Fe(III) salitsilatini atsedamid, karbamid, tiokarbamid va nikotinamid bilan turli amidli koordinatsion birikmalarini sintez qilish;
- sintez qilingan koordinatsion birikmalarning tarkibi, tuzilishi va xossalarini taxlilni fizik-kimyoviy usullari bilan aniqlash;
- Fe(II) va Fe(III) salitsilatini turli amidli koordinatsion birikmalarini kvant kimyoviy usullar bilan geometriyasi, energetic parametrlarini va reaksion qobiliyatini hisoblash;
- sintez qilingan moddalarning biologik faolligi va toksikligini tadqiq qilish.

Tadqiqot obôekti: Fe(II) va Fe(III) salitsilatlari, atsedamid, karbamid, tiokarbamid va nikotinamid.

Tadqiqot predmeti: Fe(II) va Fe(III) salitsilatini aralash amidli koordinatsion birikmalari, biologik faollik va fizik-kimyoviy xossalar.

Tadqiqot uslubiyoti va uslubi: differentsial termik taxlil, roentgen fazaviy taxlil, IQ- va electron-spektroskopiya, hisoblashni kvant-kimyoviy usuli.

Tadqiqot natijalarining ilmiy jihatdan yangilik darajasi: Ilk bor Fe(II) va Fe(III) salitsilatini atsedamid, karbamid, tiokarbamid va nikotinamid bilan 12 ta yangi aralash amidli koordinatsion birikmalari sintez qilinadi.

Sintez qilingan birikmalarning termik xossalari oôrganiladi va termoliz mahsulotlari aniqlanadi.

Rentgen fazaviy taxlil, IQ- va DQES-yordamida sintez qilingan birikmalarning individualligi, ligandlarni, salitsil guruhning koordinatsiyalanish usullari va koordinatsion tugunning geometriyasi aniqlanadi.

Kvant kimyoviy usullar yordamida olingan koordinatsion birikmalarning energetic parametrlari, zaryadlarni atomlarda taqsimlanishi, geometriyasi va reaksion qobiliyati hisoblanadi.

Tadqiqot natijalarini amaliy ahamiyati va tatbiqi: ilk bor Fe(II) va Fe(III) salitsilatini ayrim amidlar va tiokarbamid bilan aralash amidli koordinatsion birikmalarini olinadi.

Ularning fizik-kimyoviy xossalari taxlil qilinadi va IQ-, DQES-spektrlar, drivatografiya, shuningdek rentgen fazaviy taxlil natijasiga asoslanib olingan birikmalarning struktura formulalari taklif qilinadi. Olingan aralash ligandli birikmalarning biologic xossalari oὂrganiladi.

Olingan natijalar ñ5140500-Kimyoò yoὂnalishi talabalariga ñKoordinatsion birikmalar kimyosiò va ñTaxlilning fizik-kimyoviy usullariò kurslarini oὂqishda maὂlumotnoma sifatida foydalanilishi mumkin.

Ishning tuzilishi va tarkibi: Ish kirish, tadqiqot obὂekti va predmeti, tajriba qismi, olingan natijalar taxlili, umumi xulosalar, foydalanilgan adabiyotlar roὂyxati va ilovadan iborat.

Bajarilgan ishning asosiy natijalari: tadqiqot mavzusi boὂyicha 1 ta maqola chop qilingan.

Xulosa va takliflarni qisqacha umumlashgan ifodasi: Fe(II) va Fe(III) salitsilatini ilk bor sintez qilingan 12 ta yangi koordinatsion birikmalari tarkibi, tuzilishi va fizik-kimyoviy xossalari aniqlandi. Taxlilning fizik-kimyoviy usullari va kvant-kimyoviy hisoblash yordamida sintez qilingan birikmalar tarkibi, individualligi, tuzilishi va energetik parametrlari aniqlandi.

Ilmiy rahbar: ______________________________

(imzo)

Magistratura talabasi ______________________________

(imzo)

MINISTRY OF HIGHER AND SECONDARY SPECIALIZED EDUCATION OF THE REPUBLIC OF UZBEKISTAN

Urgench State University

Faculty Natural science — Student magistracy Abdullaeva Z.Sh.
Department Chemistry — Scientific supervisor Hasanov Sh.B.
Academic year 2014-2016 — Specialty Inorganic chemistry

ANNOTATION MASTER DISSERTATION

the undergraduate chair of Chemistry Urgench State University Abdullayeva Zubaida Shavkatovna on "Mixed ligands coordination compounds salicylates iron (II) and iron (III)»

Actuality of theme: great interest of researchers induce compounds having biological activity. These include salicylic (o-hydroxybenzoic acid) o-HOC_6H_4COOH - one of the most important hydroxyaromatic acid which is found more practical applications. This acid is widely used in the pharmaceutical industry in the production of antiseptics, disinfectants, anti-rheumatic and febrifuge. Salicylic acid is also of interest from a theoretical point of view. This acid - compound mixed function because it contains both phenolic and carboxylic groups. The latter are in the ortho - position relative to one another, which is favorable for the formation of metal chelate compounds, which value, in particular for common analytical chemistry in connection with the problem of the separation of elements is steadily increasing.

Amides is the ambident molecule containing electrons oxygen atoms and nitrogen atoms, thiourea contains sulfur and nitrogen. Determination of the focal points of amides, thiourea and salicylic acid is of great interest.

It should also be noted that the mixed amides compound containing amides and salts of the acetates, oleates, palmitates studied by many authors. In a number of the synthesized compounds were found substances having biological activity.

Some of the synthesized compounds is the stimulates the growth and development of cotton.

The purpose of work: Determine the conditions of education, the composition and structure of coordination compounds of amides, thioamides and nicotinamide with salicylates iron; study of the influence of composition on the structure, thermal behavior and identify properties of complexes depending on the composition and structure.

Work tasks: To achieve this goal should achieve the following tasks:

- The synthesis of coordination compounds mixed's amide salicylates Fe (II) and Fe (III) with acetamide, urea, thiocarbamide and nicotinamide;
- The establishment of the composition, structure and properties synthesized of coordination compounds by physical and chemical methods of analysis;
- Calculation of geometry, energy parameters and reactivity of complexes of salicylates mixed amide salicylates Fe (II) and Fe (III) quantum-chemical methods;
- The study of the biological activity and toxicity of the compounds synthesized.

The object of study: salicylates Fe (II) and Fe (III), acetamide, urea, thiourea, nicotinamide.

Subject of study: mixed amid coordination compounds salicylates Fe (II) and Fe (III), biological activity and physicochemical properties.

Research methods and techniques: differential thermal analysis, X-ray diffraction, IR and electronic - spectroscopy, quantum-chemical calculation method.

Degree of novelty of the research results from the scientific point of view: For the first time will be synthesized 12 new coordination compounds mixed amides salicylates Fe (II) and Fe (III) with acetamide, urea, thiocarbamide and nicotinamide.

Will research the thermal behavior of the synthesized compounds were identified and thermolysis products.

X-ray diffraction analysis, IR spectroscopy and DSR- set individually synthesized compounds, methods of coordination ligands salicylate group and the geometry of coordination unit.

Quantum-chemical methods will calculate the energy parameters, the distribution of charges on the atoms, the geometry and reaction of obtained coordination compounds.

The introduction and practical value of the results of research: for the first time obtained new compound mixed amides salicylates Fe (II) and Fe (III) and some amides and thiocarbamide.

Will be examined physico-chemical properties and structural formulas of the proposed compounds on the basis of IR spectroscopy DSR spectra, derivatography and XRD. Will examine the biological properties of the mixed amides complexes .

The research results can be used as reference material for courses "Coordination chemistry" and "Physical and chemical methods of analysis" in "5140500 - Chemistry".

The structure and composition of the of work: The work consists of an introduction, the subject and object of research, experimental research, analysis of the results, general conclusions, bibliography and appendices.

The basic results of the work: at the topic of work published one scientific paper.

The abbreviated generalized expression of conclusions and suggestions: The composition of individuality and physico-chemical properties of the newly synthesized compounds 12 salicylates mixed amides Fe (II) and Fe (III). Physico-chemical methods of analysis and quantum chemical calculations to determine the composition, identity, structure and energy parameters of the synthesized compounds.

Scientific supervisor: ____________________________

(signature)

MA student: ____________________________

(signature)

[illegible]

ʉʃ ɾɾʈɾ ɸɿ ʀɾ

[illegible]

[illegible] $o\text{-}HOC_6H_4COOH$ [illegible]

[illegible]

[illegible] Fe(II) [illegible] Fe (III), [illegible]

[illegible]: [illegible] Fe(II) [illegible] Fe (III), [illegible]

[illegible]: [illegible]

[illegible]:

[illegible]:

- [illegible] Fe(II) [illegible] Fe (III) [illegible]
- [illegible]
- [illegible] Fe(II) [illegible] Fe (III) [illegible];
- [illegible].

[illegible]

[illegible] 20 [illegible] (II) [illegible] (III) [illegible]

[illegible]

[illegible]

[illegible] Fe (II) [illegible] Fe (III), [illegible]

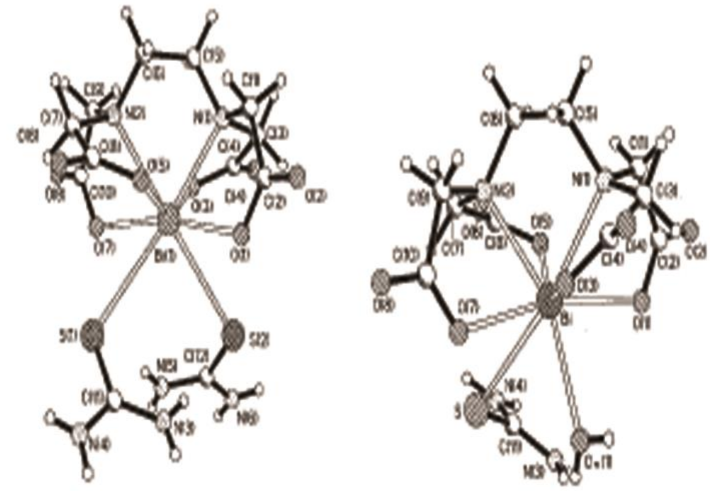
[illegible] Fe(II) [illegible] Fe (III) [illegible]

[illegible] «5140500 [illegible]». [illegible]

[illegible] I. [illegible]

1.1. [illegible], N- [illegible] S, N [illegible]

[illegible] Bi(III) [illegible] (III) [illegible] $(CH_7N_4)[BiEdta(\ldots)_2]\cdot 2.5H_2O$ [illegible] $(CH_7N_4)[BiEdta(\ldots)\ldots_2]\cdot 2H_2O$. [illegible] $(CH_7N_4)^+$, [illegible] $[Bi(Edta)(\ldots)_2]^-$ [illegible] $[Bi(Edta)(\ldots)(H_2O)]^-$, [illegible] H_2O. [illegible] $[Bi(Edta)(\ldots)_2]^-$ (а) [illegible] $[Bi(Edta)(\ldots)(H_2O)]^-$ (в) [illegible] $(CH_7N_4)[BiEdta(\ldots)_2]\cdot 2.5H_2O$ [illegible] $(CH_7N_4)[BiEdta(\ldots)(H_2O)]\cdot 2H_2O$ [illegible] ([illegible] 1.1.).



[illegible] 1.1. [illegible] $[Bi(Edta)(\ldots)_2]^-$ (а) [illegible] $[Bi(Edta)(\ldots)(H_2O)]^-$ (в) [illegible] $(CH_7N_4)[BiEdta(\ldots)_2]\cdot 2.5H_2O$ [illegible] $(CH_7N_4)[BiEdta(\ldots)(H_2O)]\cdot 2H_2O$

[illegible] $[Bi(Edta)(\ldots)_2]^-$ [illegible] $[Bi(Edta)(\ldots)(H_2O)]^-$ [illegible] $Edta^{4-}$ [illegible] Bi [illegible] 8. [illegible] 4 [illegible] $Edta^{4-}$. [illegible]

(CH₇N₄)[BiEdta(…)₂]·2.5H₂O … Bi, …

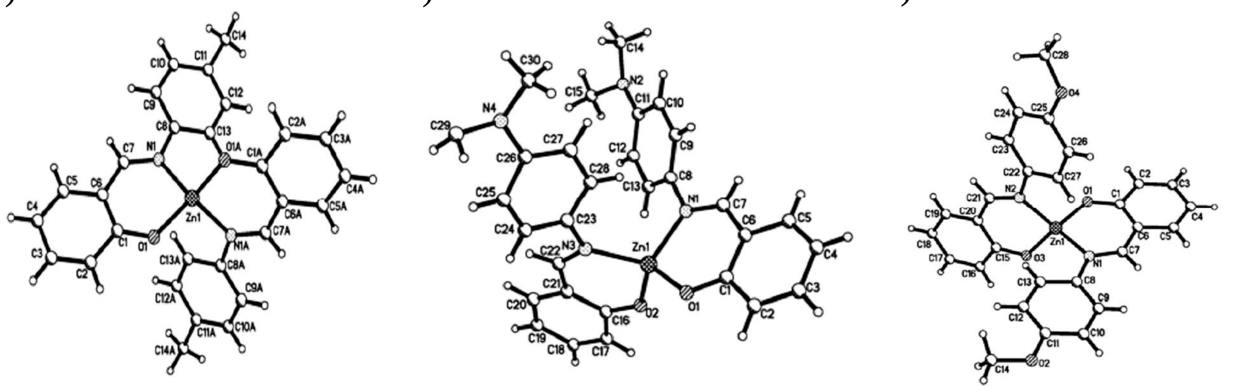
… (CH₇N₄)[BiEdta(…)(H₂O)]·2H₂O … Bi … 8 … Bi … H_2O. … (CH₇N₄)[BiEdta(…)₂]·2.5H₂O … (CH₇N₄)[BiEdta(…)(H₂O)]·2H₂O … (CH₇N₄)[BiEdta(…)₂]·2.5H₂O … Bi – S … 3.0110(5) … 3.1044(5) Å. … (CH₇N₄)[BiEdta(…)(H₂O)]·2H₂O … Bi – S … 3.1665(7) Å, … Bi … H_2O … 2.604(1) Å.

… (CH₇N₄)[BiEdta(…)(H₂O)]·2H₂O … (III), … $Edta^{4-}$ … H_2O [1].

… [2-11] … ν(N–H) … ~8.33–10.88 … O–H···N=C, …

…

[illegible]) в) [illegible])

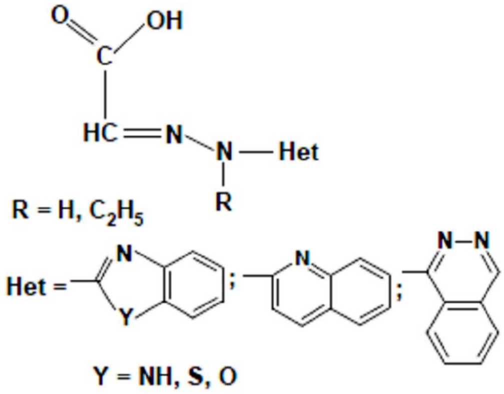


[illegible] 1.2. [illegible] $Zn(SH1)_2$ ([illegible]), $Zn(SH2)_2$ (в), $Zn(SH3)_2$ ([illegible]).

[illegible] ZnL_2 [illegible] $Zn(SH1)_2$ ($R = CH_3$) [illegible] $Zn(SH3)_2$ ($R = OCH_3$) [illegible] [3-5]. [illegible] ZnL_2 [illegible]: $Zn(SH1)_2$ – $Zn(SH2)_2$ – $Zn(SH3)_2$, [illegible] R [illegible] (1.2). [illegible] ZnII [illegible] R [illegible] R, [illegible] CH_3 ([illegible] 1.2, [illegible]), $N(CH_3)_2$ ([illegible] 1.2, в) [illegible] OCH_3 ([illegible] 1.2, [illegible]) [illegible].

[illegible] [12] [illegible] **1**. [illegible] [illegible] [1] [illegible].

[illegible] **1** [illegible] Mn(II), Ni(II) [illegible] $[(HL)_2M]$, [illegible] HL – [illegible].

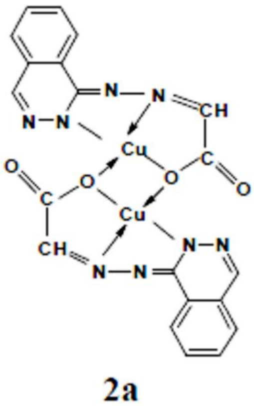


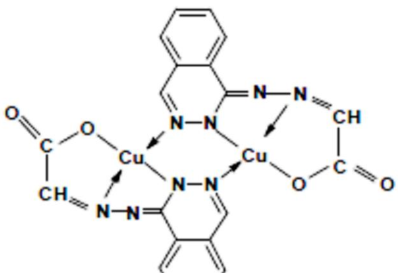
1

[illegible] (II) [illegible] 2,8 [illegible] 3,0 [illegible] (S = 1)., [illegible] (II) [illegible] = 5,8 - 6,1 [illegible] (S = 5/2).

[illegible] Cu(II) [illegible] [CuL]$\cdot CH_3OH$. [illegible] 1,78 -2,0 [illegible]

[illegible] Cu(II) [illegible] **2,** [illegible] **2a**, [illegible] **2b.**





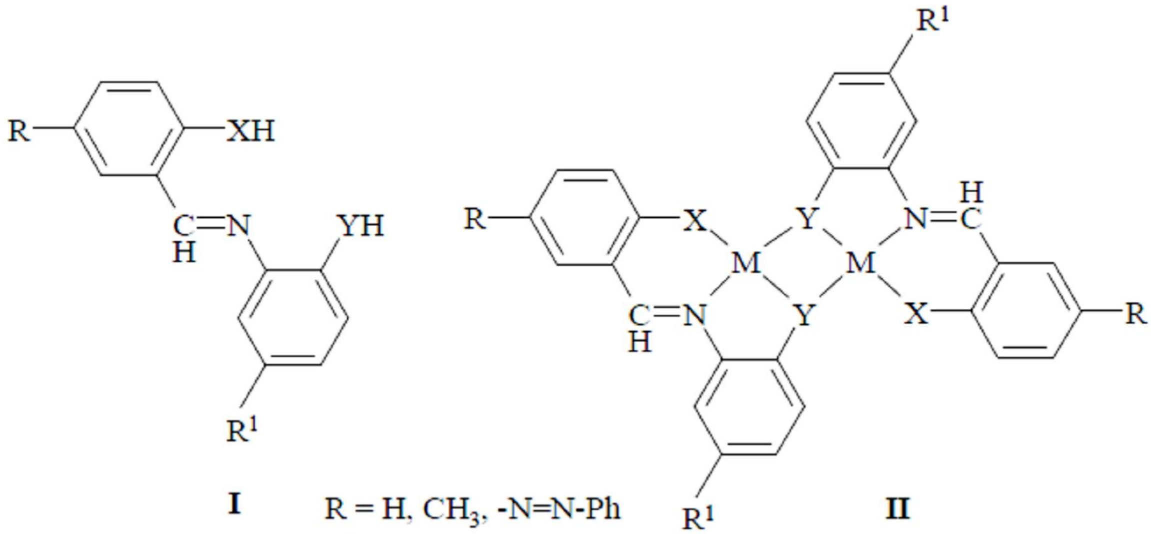
2a **2b**

[illegible] **2** [illegible] (2J = -136 [illegible]$^{-1}$) [illegible] **2a.**

[illegible] Zn(II), [illegible].

[illegible] St-Haphylococcus aureus [illegible] Escherichia coli [illegible].

[illegible] [13] [illegible] 5-[illegible].



I II

R = H, CH_3, -N=N-Ph
R^1 = H, NO_2
X = O, NTs
Y = O, NAlk, S
M = Co, Cu, Mn, Fe

[illegible] **I** [illegible].

[illegible] R = -N=N-Ph [illegible]

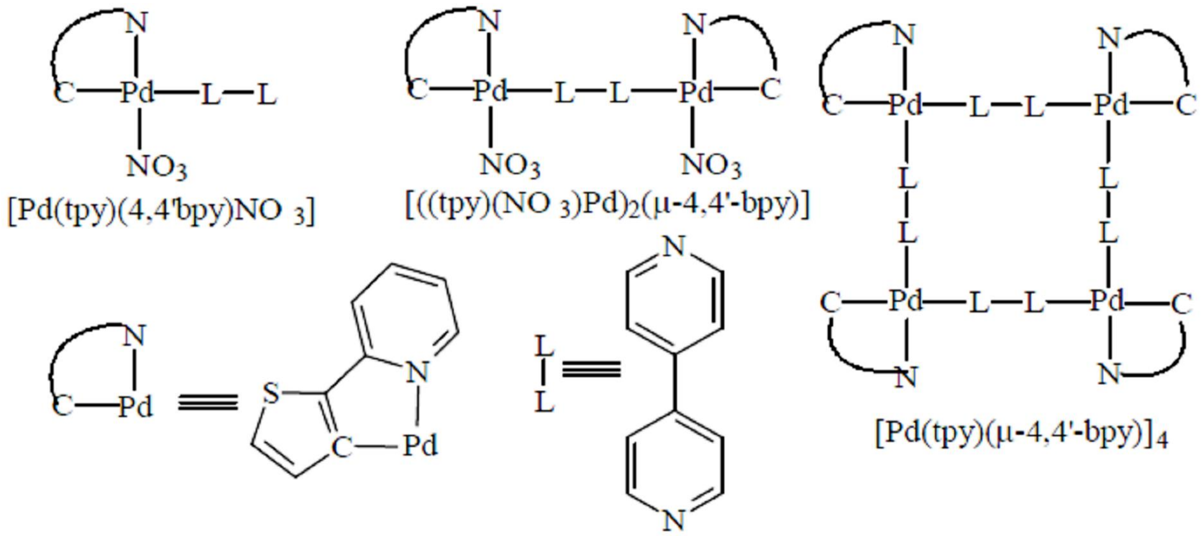
[illegible]

[illegible] II [illegible]

[illegible] II [illegible] (EXAFS).

[illegible] II [illegible] 2-300 [illegible] X=S [illegible] X=O, N-C_2H_5 [illegible].

[illegible] [Pd(tpy)(4,4ô-bpy)]$^+$ [illegible] [((tpy)(NO_3)Pd)$_2$(m-4,4ô-bpy)] [illegible] [PdItpy)(4,4ô-bpy)]$_4^{4+}$ [illegible] (tpy- [illegible] 2-(2ô-[illegible]) 4,4ô-bpy [illegible] 4,4ô-[illegible] [14]:



[illegible] ^{1}[illegible] 4,4ô-

[illegible]

[illegible] 4,4′-[illegible] [illegible]

[illegible] {Pd(tpy)} [illegible] p*- [illegible]

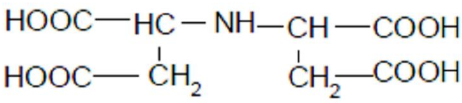
[illegible] Na_4hep – HGly – H_2O – NaCl (I=0.15NaCl) [illegible] [15]. [illegible] $hepGly_3^{7-}$ (*lgβ=9.42±0.10*), $H_2hepGly_3^{5-}$ (*lgβ=28.80±0.10*) [illegible] $H_3hepGly_3^{4-}$ (*lgβ=36.45±0.14*). [illegible] $H_3HepGly_3^{4-}$ [illegible] (6.80 [illegible] 7.40). [illegible] hep [illegible] Gly (1:3) [illegible] [16, 17]. [illegible] (1:3) [illegible]

[illegible] pH-[illegible] Cl_2 – Na_4hep – HGly – H_2O – NaCl ([illegible] :

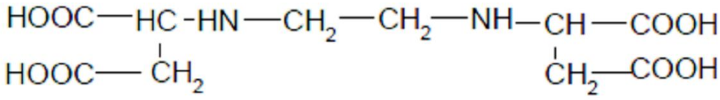
Ca^{2+}, Mg^{2+}), (I=0.15NaCl) [illegible] Ca^{2+} [illegible] Mg^{2+} [illegible] $MH_3hepGly_3^{2-}$.

[illegible] 1:3:1 [illegible] Na_4hep, HGly [illegible] $CaCl_2$. [illegible] pH [illegible] 5.7 [illegible] $MH_3hepGly_3$, [illegible] 1:1:1 [illegible] 3.5 [illegible] $MH_3hepGly_3^{2-}$ [illegible] 3 [illegible] $NCahep^-$.

[illegible] [18] [illegible] ([illegible]) [illegible] ([illegible])):



ИДЯК



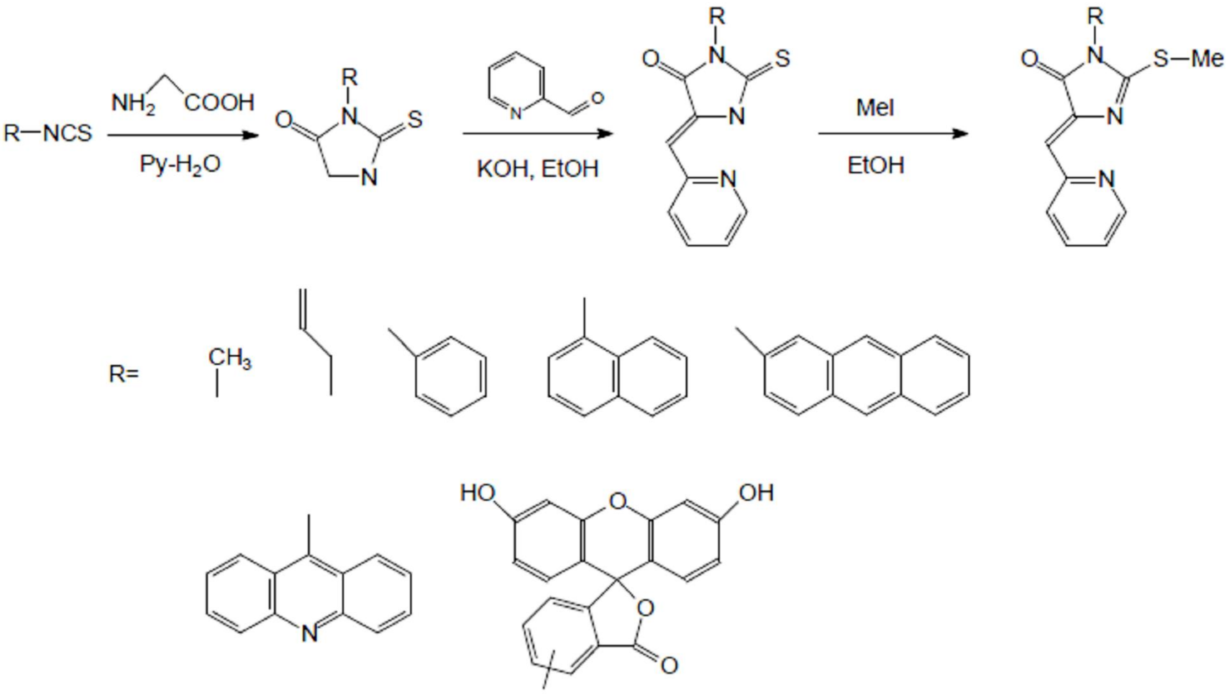
ЭДДЯК

[illegible] Al [illegible] CLINP 2.0) [19], [illegible] [20]. [illegible] 1.1.

[illegible] 1.1.

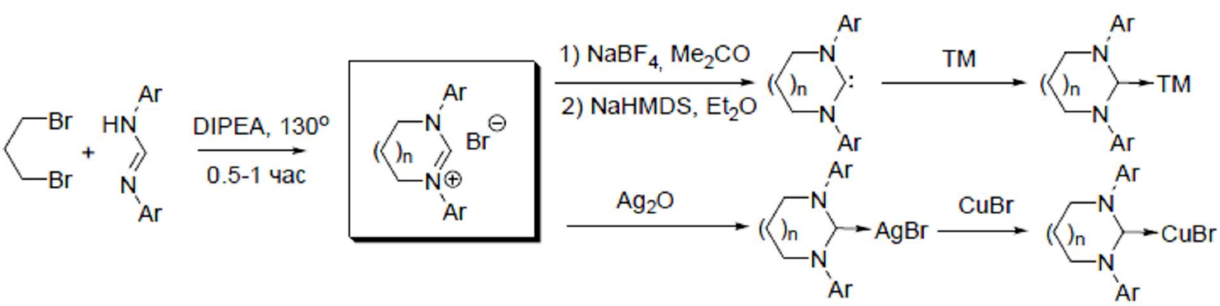
[illegible]	pK_4	[illegible]	
		A1L	A1HL
[illegible]	10.02	11.1±0.1	12.2±0.2
[illegible]	9.84	13.8	-

[illegible] 1.1. [illegible] Al [illegible] (pK_4 = 10,02) [illegible]



[illegible] (I) [illegible] (II).

[illegible] N-[illegible]



n = 0-2; Ar = Dipp, Mes

[illegible] (>70%)

[illegible] (I). [illegible] (I).

[illegible] N-[illegible] (I), [illegible] (II), [illegible] (I), [illegible] (II), [illegible] (II).

[illegible] (I) [illegible] [22].

[illegible] [23] [illegible] 28 [illegible] (II) [illegible] (II) [illegible] 14 [illegible] (II) [illegible] 1,3,5-[illegible] (II) [illegible] (II), [illegible] (II) [illegible].

[illegible] (II) [illegible].

[illegible] [24]. [illegible] Pd(II), Pt(II), Zn(II), Cu(II), Ir(II) [illegible] 3,5- [illegible] (N,N- [illegible] N,O- [illegible]). [illegible] 1[illegible] - [illegible] 2[illegible] - [illegible] 2- [illegible] 7 [illegible].

[illegible] 12 [illegible]: [$Zn(ICH_2CONH_2)_6$][ZnI_4]·ICH_2CONH_2, [$Zn(C_6H_5CONH_2)_2I_2$], [$Zn(CH_3NHCONHCH_3)_2I_2$], [$Zn(CH_3CSNH_2)_2I_2$], [Zn(THPT)I_2] (THPT = 5- [illegible] 1,4- [illegible] 1,2,3,4- [illegible] 2- [illegible]), [Cd(THPT)$_2I_2$], [$Cd(CH_3CSNH_2)_2I_2$], [$Cd(CH_3NHCONHCH_3)_3I_2$], [$Cd(C_6H_5CONH_2)_4I_2$], [$Cd(ICH_2CONH_2)_6$][Cd_2I_6], [$Cd(HCONH_2)_4I_2$] [illegible] [[illegible]$d_3(HCONH_2)_2I_{12}$] [25-33]. [illegible] 18 [illegible], [illegible] 12 [illegible]: $[Zn(HCONH_2)_2I_2]$, $[Cd(HCONH_2)_2I_2]_n$, $[Zn(CH_3CONH_2)_2I_2]$, $[Cd(CH_3CONH_2)_6][Cd_2I_6]$, $[Zn(CH_3CH_2CONH_2)_6][ZnI_4]$, [illegible] 5-[illegible]-1,4-[illegible]-1,2,3,4-[illegible]-2-[illegible] (THPT). [illegible] : [illegible].

[illegible] 4, [illegible] 4, 5 [illegible] 6. [illegible] 6, [illegible] $[ZnI_4]^{2-}$ [illegible] $[Cd_2I_6]^{2-}$, [illegible] 4.

[illegible] $[Zn(THPT)I_2]_n$ [illegible] (4) [illegible] 6) [illegible].

[illegible]:

$C_6H_5CONH_2$ ≈ $CH_3NHCONHCH_3$ < $HCONH_2$ < I^- < NH_2CONH_2 ≈ CH_3CONH_2 < $CH_3CH_2CONH_2$ ≈ ICH_2CONH_2 [illegible].

[illegible], [illegible]

[illegible] [illegible] $[Cd(FA)_2I_2]_n$. [illegible] $[Cd(FA)_4I_2]$, [illegible] $[Cd_3(FA)_2I_6]_n$.

[illegible] $[Zn(AA)_6][I_{10}]$ [illegible] $[Cd(AA)_6][I_{10}]$, [illegible] [34]. [illegible]

[illegible] -2 [35].

[illegible] [36-43] [illegible] 2-(2-[illegible])-[illegible]-1,3 [illegible] 2-(2-[illegible])-3-[illegible]-1, [illegible] 2-(2-[illegible])-3-[illegible]-1,3 [illegible] 3-[illegible] 14 [illegible].

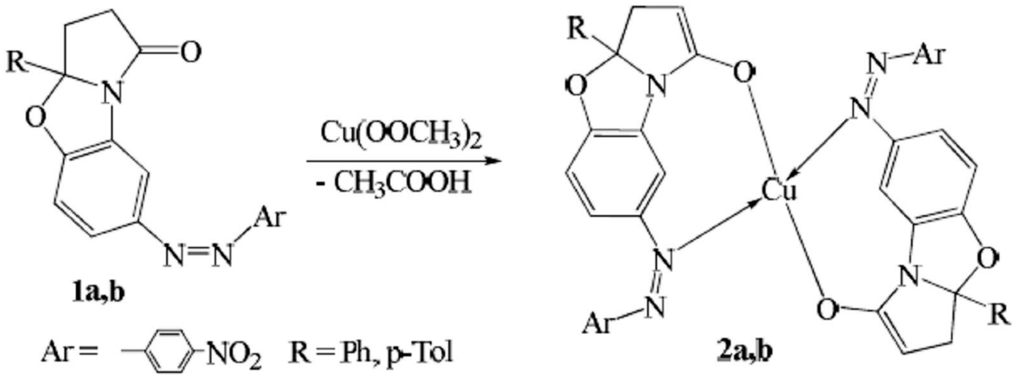
[illegible] 70 [illegible] d-[illegible].

[illegible] ^{1}[illegible] [illegible] ^{13}[illegible] [illegible] 2-(2-[illegible])-[illegible]-1,3 [illegible] 2-(2-[illegible])-3-[illegible]-1 [illegible].

ʉ lstctsj dʑʆj ʢtsdʒʃdʓʢfŋdž ˭ fŋʂj нʆdʓdʑʆʡ, ɘʢdž ʯʘ ʰ j j fŋʃtsfŋʂв dʑsʢʘdʑʆʟʘʯʆʆ ʢtststcнʆdʑʘʯʆtsdʑdʑsʡ fŋʚʷʟʆ, нtsʢʘʟʘdʑs нʘdʑdž dʒʆ ʀ ʂ -, [1]ʅ ʗ ʃ ʈ -fŋʃj ʢlstctsfŋʢtsʃʆʆ ʆ tcj dʑsɢj dʑsfŋlstcdʑʢlsʑtcdʑsɢts ʘdʑʘdʑʆʟʘ.

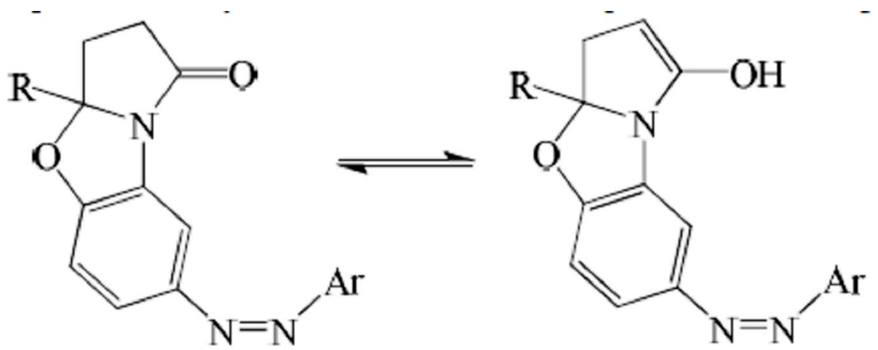
ɸ ɘlststcʘdʒʆ [44] ʧtctsɘj нj dž fŋʃdʑsj ʟʳ ʢtsdʒʃdʓʢfŋsɘ ʘʟtsfŋʂj нʆdʓdʑʆʡ 5'-(4-dʑʆlstctsʬj dʑʆdʑнʆʘj dʑʆdʑ)-вj dʑts-(2,3-*b*)-5-R-1-ʘʟʘ-4-tsʢfŋʘвʆʯʆʢdʑs-[3,3,0]-tsʢlsʘdž -8-tsdʑsɘ **1a,b** fŋʘʯj lsʘlstsdʒdʒj нʆ (II).

ʈ j ʘʢʯʆʷ ʧtctsɘtsнʆdʑʘfŋ ɘ ˡlsʘdʑsdʓ ʆdʑʆ ʘʯj lstsdʑʆlstcʆdʓ ʧtcʆ dʑʘtcj ɘʘdʑʆʆ ʆ ʧtsfŋlstsʷdʑdʑsdʒʧj tcj dʒʰ ʆɘʘdʑʆʆ.



ʇ tcj ʟʑdž lsʘlsj tcj ʘʢʯʆʆ ɘʳ нj dʓdž fŋʂj нʆdʓdʑʆʷ **2a,b** fŋɘʳ ˭tsнʘdʒʆ нts 75%.

ʇ tsʢʘʟʘdʑs, ʯlsts fŋʂj нʆdʓdʑʆʷ **1a,b** ʧj tcɘtsdʑʘʯʘdž dʑs ʧtsнɘj tcɢʘ lsfŋ j dʑsdʑʆʟʘʯʆʆ fŋ ʧtsfŋdʓнʑ ʰ ʆdʒ ˭j dʑʘlsʆtctsɘʘdʑʆj dʒ fŋ ʑʯʘfŋlsʆj dʒ j dʑsdž dž ˭ ɢʆнtctsʢfŋʃdʑsɘ ʆ ʘʟtsɢtcdʑʧʃ.



ʇ ʀ ʂ -fŋʃj ʢlstcʘ˭ fŋʂj нʆdʓdʑʆʡ **2a,b** tslsdʒj ʯj dʑs tslsfŋʑlsfŋlsɘʆj ʧtsdʑsfŋ ʧtsɢdʑsʰ j dʑʆʷ C=O ɢtcdʑʧʃ, tslsdʒj ʯj dž ʆdʑsj dʑfŋʃɘdž j ʧtsdʑsfŋ ʧtsɢdʑsʰ j dʑʆʷ ʘʟtsɢtcdʑʧʃ ʧtcʆ 1340ï 1345 fŋdʒ$^{-1}$.

ʂ tsdʒʃdʓʢfŋ ʘʟtsfŋʂj нʆdʓdʑʆʡ fŋ ʆtsdʑʘdʒʆ lsʷʯʸdž ˭ dʒj lsʘdʑdʑsɘ ʆʟɘj fŋlsdž нtsfŋlsʘlstsʯdʑs нʘdʑs. ʈ ʘdʓj вʳ dʑs ʆʟɘj fŋlsdʑs, dʑʘʃtcʆdʒj tc, ʯlsts dʓʢtslststcʳ j ʘʟtsʢtcʘfŋʃlsj dʑʆ fŋʃtsfŋʂвdž tsвtcʘʟtsɘʳ ɘʘlsʳ ʢtsdʒʃdʓʢfŋ fŋdʒj lsʘdʑdʑʘdʒʆ. ʇ dʑʘfŋlstsʷʰ j j ɘteʝ dʒʷ dʑʘʃʙtsdʝ ʝ ʗʟlzɥʘ dʒʳ dʒʗ teʝ ʘʕɥʗʷdʒʗ ʘʟtsfŋsʝ нʗdʝ dʑʗʔ fŋ ʗtsdʑʘdʒʗ lsʷʞʸdž ≒ dʒʝ lsʘdʑdʑtsɘ ʷɘdžʷʶ lsfŋʸ teʝ ʘʕɥʗʗ ʕtsdʒʃ dʝ ʕfŋstsʙ teʘʟtsɘʘdʑʗʷ ʘteʗdʑʘʟtsʗdʒʗнʘʟtsdʑtsɘ, ʘteʗdʑʘʟtsʃʗteʗнʗdʑtsɘ, ʘlsʘʕʞʝ dʝ ʕtslststeʳ ≒ нtedzɢʗ≒ ʘʟtsfŋsʝ нʗdʝ dʑʗʔ [45,46].

1.2. ʂ tststeнʗdʑʘɥʗtsdʑdž ʝ fŋsʝ нʗdʝ dʑʗʷ fŋsdʝʔ ʕʘteʙtsdʑtsɘʳ ≒ ʕʗfŋdʑsls fŋʘdʒʗнʘdʒʗ

Ɉ teʘʙtslsʘ≒ [47-56] ʃteʗɘtsнʷlsfŋʸ lzfŋdʑtsɘʗʷ fŋʗdʑsʝ ʟʘ tsнdʑststetsнdʑtsdʑʗɢʘdʑнdž ≒ ʕtsdʒʃ dʝ ʕfŋsɘ ʃʘdž dʒʗlsʘststsɘ, tsdʝ ʘststsɘ, fŋsʝ ʘteʘststsɘ teʷнʘ3d- dʒʝ lsʘdʑdʑtsɘ fŋʘɥʝ lsʘdʒʗнtsdʒ ʕʘteʙʘdʒʗнtsdʒ lsʗtsʕʘteʙʘdʒʗнtsdʒ ʗ dʑʗʕtslsʗdʑʘdʒʗнtsdʒ ʉʗdʑsʝ ʟʗtetsɘʘdʑs ɘ lsɘʝ teнtsdʒ fŋsfŋststsʷdʑʗʗ 48 dʑtsɘʳ ≒ ʕtststeнʗdʑʘɥʗtsdʑdž ≒ fŋsʝ нʗdʝ dʑʗʔ, lzfŋsʘdʑtsɘdʝ dʑts fŋsfŋsʘɘ, ʗdʑнʗɘʗнlzʘdž dʑtsfŋsʳ ʗ fŋststetsʝ dʑʗʝ ʃtsdʑlzɥʝ dʑdž ≒ fŋsʝ нʗdʝ dʑʗʔ. ʌ ʗʟʗʕts-≒ʗdʒʗɥʝ fŋʕʗdʒʗ dʒʝ lstsнʘdʒʗ ʘdʑʘdʑʗʟʘ lzfŋsʘdʑtsɘdʝ dž, tsʕtedzʞʝ dʑʗʝ ɥʝ dʑsteʘdž dʑtsɢts ʗtsdʑʘ fŋʃtsfŋsʙʳ ʕtststeнʗdʑʘɥʗʗ dʑʗɢʘdʑнtsɘ, lsʝ tedʒʗɥʝ fŋʕtsɢts ʃtsɘʝ нʝ dʑʗʝ, ʴdʝ ʕlstetsdʑdʑʘʸ fŋstedzʕlslzteʘ ʗ teʝ ʘʕɥʗtsdʑdʑʘʸ fŋʃtsfŋsʙ dʑtsfŋsʳ fŋʗdʑsʝ ʟʗtetsɘʘdʑdž ≒ ʕtsdʒʃ dʝ ʕfŋsɘ. ɸ dʑʘdʑʗʟ ʃtsdʑlzɥʝ dʑdž ≒ нʘdʑdž ≒ ʃtsʕʘʟʘdž ɥlsts dʒtsdʝ ʕlzdž ʘɥʝ lsʘdʒʗнʘ ʕʘteʙʘdʒʗнʘ ʕtststeнʗdʑʗtedzʶ lsfŋʸ ɥʝ teʝ ʟ ʘststsdʒ ʕʗfŋdʑststetsнʘ ʕʘteʙtsdʑʗdž dʑtsʔ ɢtedzʃʃʳ, ʘ ɘ lsʗtsʕʘteʙʘdʒʗнʝ ʕtststeнʗdʑʘɥʗʷ tsfŋlzʰ ʝ fŋsɘdžʷʝ lsfŋʸ ɥʝ teʝ ʟ ʘststsdʒ fŋʝ teʳ. ɩ ʗʕtslsʗdʑʘdʒʗн dʒtsdʑtsнʝ dʑsʘsdʑts ʕtststeнʗdʑʗtedzʝ lsfŋʸ ɥʝ teʝ ʟ ɢʝ lsʝ tetsʘststsdʒ ʘʟtslsʘ ʃʗteʗнʗdʑtsɘtsɢts ʕtsdž ɥʘ ɟ teʗ ʕtststeнʗdʑʘɥʗʗ ʘdʑʗtsdž ʞʗtedž ≒ ʕʗfŋdʑsls ʷɘdžʷʶ lsfŋʸ dʒtsdʑts- ʗdʑʗ ʙʗнʝ dʑsʘsdž dʒʗ dʑʗɢʘdʑнʘdʒʗ. ʈ ʝ ʟlzdž lsʘsʳ ʘdʑʘdʑʗʟʘ нʘdʑdž ≒ fŋʃʝ ʕlstetsɘ нʗʬʬ lzʟdʑtsɢts tslsteʘʞʝ dʑʗʷ (ʉ ɼ ʃ) ʃtsʕʘʟʳ ɘʘʳ ls ʰ ʝ fŋsʗʕtststeнʗdʑʘɥʗtsdʑdʑsʝ tsʕtedzʞʝ dʑʗʝ ʘststsdʒʘ ʕtsʙʘdž lsʘ нdžʸ ʃʘdž dʒʗlsʘsdž ≒ ʕtsdʒʃ dʝ ʕfŋsɘ.

Ɉ teʘʙtslsʘ≒ [57-62] ʘɘlststetsdʒ teʘfŋfŋdʒtslsteʝ dž ʕtststeнʗdʑʘɥʗtsdʑdž ʝ fŋsʝ нʗdʝ dʑʗʷ tsdʝ ʘststsɘ teʷнʘ 3d-dʒʝ lsʘdʑdʑtsɘ fŋ ʘɥʝ lsʘdʒʗнtsdʒ ʕʘteʙʘdʒʗнtsdʒ lsʗtsʕʘteʙʘdʒʗнtsdʒ dʑʗʕtslsʗdʑʘdʒʗнtsdʒ ʗ dʑʗʕtslsʗdʑtsɘtsʔ ʕʗfŋdʑslstsʔ. Ɉ ʃʝ teɘʳ ʝ fŋʗdʑsʝ ʟʗtetsɘʘdž 33 dʑtsɘʳ ≒ fŋdʒʰ ʘdʑdʑtsdʑʗɢʘdʑнdž ≒ ʕtststeнʗdʑʘɥʗtsdʑdž ≒ fŋsʝ нʗdʝ dʑʗʔ tsdʝ ʘststsɘ ʕtsʙʘdž lsʘ (II), dʑʗʕʝ dž (II), dʒʝ нʗ (II) ʗ ɥʗdʑʕʘ lzfŋsʘdʑtsɘdʝ dž fŋstetsʝ dʑʗʝ ʗ fŋsʔ fŋsɘʘ ʃtsdʑlzɥʝ dʑdž ≒ fŋsʝ нʗdʝ dʑʗʔ. Ɉ teʝ ʟlzdž lsʘsʝ ʘdʑʘdʑʗʟʘ fŋʃʝ ʕlstetsfŋʕtsʃʗɥʝ fŋʕʗ≒ нʘdʑdž ≒, ʕɘʘdʑststsɘts≒ʗdʒʗɥʝ fŋʕʗ≒ teʘfŋɥʝ lstsɘ lzfŋsʘdʑtsɘdʝ dž fŋʃtsfŋsʙʳ ʕtststeнʗdʑʘɥʗʗ dʒtsdʝ ʕlzdz ʘdʒʗнtsɘ, dʑʗʕtslsʗdʑtsɘtsʔ ʕʗfŋdʑslsʳ, tsdʝ ʘsdž ≒ ʘdʑʗtsdʑtsɘ ʗ ʃteʝ нdʑtsʞʝ dʑts fŋstetsʝ dʑʗʝ

[illegible]

[illegible] 2. [illegible]

2.1. [illegible]

[illegible]: $FeSO_4 \cdot 7H_2O$, $FeCl_3 \cdot 6H_2O$, [illegible] NaOH, [illegible] [48]. [illegible] (CH_3CONH_2) [illegible], [illegible] ($CO(NH_2)_2$) [illegible], [illegible] ($CS(NH_2)_2$) [illegible], [illegible] ($NH_2NHCONH_2$) [illegible] [93]. [illegible] [94], [illegible] -2,0 [illegible] [95]. [illegible] [96, 97], [illegible] I/I$_1$, [illegible].

[illegible] 400-4000 [illegible]$^{-1}$ [illegible] AVATAR-360 [illegible] «Nicolet» [illegible].

[illegible] SPECORD M-40.

[illegible] 1,4 [illegible] 0,2 [illegible].

[illegible] [98] [illegible] 10 [illegible] 0,1 [illegible] -900, [illegible] -100, [illegible] -1/10, [illegible] -1/10. [illegible] 7 [illegible] Al_2O_3.

[illegible] PM3 [illegible] HyperChem [illegible].

2.2. [illegible] (II) [illegible] (III)

[illegible] (II) [illegible] (III) [illegible].

[illegible] $M(Sal)_2$:L_1:L_2 [illegible] 1:1:1, [illegible] 15 [illegible] 10-12 [illegible] Fe(II) [illegible] Fe(III) [illegible] ([illegible] 2.1, 2.3). [illegible] 2.4.

[illegible] 2.1.

[illegible] (II)

[illegible]	$Fe(C_6H_4(OH)COO)_2\cdot 4H_2O$ [illegible]	[illegible]					[illegible]
		AA [illegible]	K [illegible]	TK [illegible]	HTK [illegible]	AHK [illegible]	
$Fe(Sal)_2\cdot AA\cdot K$	1,8900 0,005	0,2950 0,005	0,3000 0,005				11
$Fe(Sal)_2\cdot AA\cdot TK\cdot H_2O$	1,8900 0,005	0,2950 0,005		0,3800 0,005			12
$Fe(Sal)_2\cdot AA\cdot HTK\cdot 2H_2O$	0,9450 0,0025	0,1425 0,0025			0,2625 0,0025		12
$Fe(Sal)_2\cdot AA\cdot AHK\cdot H_2O$	1,8900 0,005	0,2950 0,005				0,6100 0,005	11
$Fe(Sal)_2\cdot K\cdot TK\cdot H_2O$	1,8900 0,005		0,3000 0,005	0,3800 0,005			11
$Fe(Sal)_2\cdot K\cdot HTK\cdot H_2O$	1,8900 0,0025		0,1500 0,0025		0,2525 0,0025		12
$Fe(Sal)_2\cdot K\cdot AHK\cdot 2H_2O$	1,8900 0,005		0,3000 0,005			0,6100 0,005	12
$Fe(Sal)_2\cdot TK\cdot HTK\cdot H_2O$	0,9450 0,0025			0,1900 0,0025	0,2625 0,0025		12
$Fe(Sal)_2\cdot TK\cdot AHK\cdot 2H_2O$	1,8900 0,005			0,3800 0,005		0,6100 0,005	11
$Fe(Sal)_2\cdot HTK\cdot AHK\cdot H_2O$	0,9450 0,0025				0,2625 0,0025	0,3050 0,0025	12

[illegible] (II) [illegible] (III) [illegible] [93,94], [illegible] 2.2., 2.4.).

[illegible] 2.2.

[illegible] (II)

[illegible]	[illegible], %		S, %		N, %		C, %		H, %	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
$Fe(Sal)_2 \cdot AA \cdot K$	12,54	12,47	-	-	9,60	9,35	45,40	45,43	4,76	4,23
$Fe(Sal)_2 \cdot AA \cdot TK \cdot H_2O$	11,62	11,59	6,43	6,62	8,43	8,69	42,20	42,23	4,53	4,35
$Fe(Sal)_2 \cdot AA \cdot HTK \cdot 2H_2O$	10,40	10,62	-	-	10,98	10,62	38,94	38,71	3,02	3,61
$Fe(Sal)_2 \cdot AA \cdot AHK \cdot H_2O$	11,20	11,36	-	-	8,20	8,52	53,12	53,55	4,20	4,67
$Fe(Sal)_2 \cdot K \cdot TK \cdot H_2O$	12,61	12,39	7,17	7,08	12,24	12,39	42,60	42,48	4,45	4,42
$Fe(Sal)_2 \cdot K \cdot HTK \cdot H_2O$	11,20	11,97	-	-	14,69	14,96	41,50	41,02	3,00	3,84
$Fe(Sal)_2 \cdot K \cdot AHK \cdot 2H_2O$	11,18	11,02	-	-	11,83	11,02	50,61	49,61	4,06	4,72
$Fe(Sal)_2 \cdot TK \cdot HTK \cdot H_2O$	11,20	11,47	6,00	6,56	14,53	14,34	39,40	39,34	3,76	3,69
$Fe(Sal)_2 \cdot TK \cdot AHK \cdot 2H_2O$	10,94	10,64	6,81	6,08	10,60	10,65	47,11	47,91	4,90	4,18
$Fe(Sal)_2 \cdot HTK \cdot AHK \cdot H_2O$	10,85	10,56	-	-	13,15	13,21	47,34	47,55	3,40	3,77

ʊ Ɵʙɗʑɋʯ Ɵ 2.3.

ʋ ƒɳʁʦɚ ɋʷ ƒɳɉɗʆɉ ʟɵʈɕʟɗʆɗʑɋɢɵɗʆɗ ͞ ʢ ʦʦʈʜɋɗɵʯɋʦɗʆɗ ͞ ƒɳʆɉʜɋɗɉɗɋ͢ ƒɳɵɗʑɋʯɋɗɵʆɵʮʝ ɉɗɉʟ Ɵ(II)

ʉ ʦɉʜɋɗɉɗɋɉ	$Fe(C_6H_4(OH)COO)_3 \cdot 3H_2O$ ɢ ɗɉʦɗ	ʃ ɋɢɵɗʢ					ʂ ʦɗʑɋʯɉ ƒɳɚ ʦ ʧʦɚ ʟʦʦɢɉɗɋɋ
		AA ɢ ɗɉʦɗ	K ɢ ɗɉʦɗ	TK ɢ ɗɉʦɗ	HTK ɢ ɗɉʦɗ	AHK ɢ ɗɉʦɗ	
$Fe(Sal)_3 \cdot AA \cdot K$	2,4250 0,005	0,2950 0,005	0,3000 0,005				11
$Fe(Sal)_3 \cdot AA \cdot TK \cdot H_2O$	2,4250 0,005	0,2950 0,005		0,3800 0,005			12
$Fe(Sal)_3 \cdot AA \cdot HTK \cdot H_2O$	1,2125 0,0025	0,1425 0,0025			0,2625 0,0025		12
$Fe(Sal)_3 \cdot AA \cdot AHK \cdot H_2O$	2,4250 0,005	0,2950 0,005				0,6100 0,005	11
$Fe(Sal)_3 \cdot K \cdot TK \cdot H_2O$	2,4250 0,005		0,3000 0,005	0,3800 0,005			11
$Fe(Sal)_3 \cdot K \cdot HTK$	1,2125 0,0025		0,1500 0,0025		0,2525 0,0025		12
$Fe(Sal)_3 \cdot K \cdot AHK \cdot H_2O$	2,4250 0,005		0,3000 0,005			0,6100 0,005	12
$Fe(Sal)_3 \cdot TK \cdot HTK \cdot H_2O$	1,2125 0,0025			0,1900 0,0025	0,2625 0,0025		12
$Fe(Sal)_3 \cdot TK \cdot AHK \cdot H_2O$	2,4250 0,005			0,3800 0,005		0,6100 0,005	11
$Fe(Sal)_3 \cdot HTK \cdot AHK \cdot H_2O$	1,2125 0,0025				0,2625 0,0025	0,3050 0,0025	12

[illegible] 2.4.

[illegible] (III)

[illegible]	Fe, %		S, %		N, %		C, %		H, %	
	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
$Fe(Sal)_3{\cdot}AA{\cdot}K$	9,59	9,55	-	-	7,64	7,17	49,83	49,15	4,58	4,09
$Fe(Sal)_3{\cdot}AA{\cdot}TK{\cdot}H_2O$	9,62	9,03	5,19	5,16	6,19	6,77	46,27	46,45	4,62	4,19
$Fe(Sal)_3{\cdot}AA{\cdot}HTK{\cdot}H_2O$	8,43	8,63	-	-	8,02	8,63	44,16	44,38	3,07	3,85
$Fe(Sal)_3{\cdot}AA{\cdot}AHK{\cdot}H_2O$	8,19	8,56	-	-	6,97	6,42	51,92	51,37	4,27	4,28
$Fe(Sal)_3{\cdot}K{\cdot}TK{\cdot}H_2O$	9,18	9,02	5,00	5,15	9,50	9,02	44,08	44,44	9,90	9,02
$Fe(Sal)_3{\cdot}K{\cdot}HTK$	8,43	8,86	-	-	11,96	11,08	43,39	43,67	3,51	3,48
$Fe(Sal)_3{\cdot}K{\cdot}AHK{\cdot}H_2O$	8,19	8,55	-	-	8,79	8,55	49,52	49,46	4,79	4,12
$Fe(Sal)_3{\cdot}TK{\cdot}HTK{\cdot}H_2O$	8,07	8,21	4,80	4,69	10,73	10,26	40,43	40,47	3,95	3,52
$Fe(Sal)_3{\cdot}TK{\cdot}AHK{\cdot}H_2O$	8,16	8,34	4,82	4,77	8,13	8,35	48,53	48,29	4,76	4,02
$Fe(Sal)_3{\cdot}HTK{\cdot}AHK{\cdot}H_2O$	8,16	8,00	-	-	10,70	10,00	46,61	46,29	3,81	3,71

[illegible] 2.7.

[illegible] (II) [illegible] (III)

[illegible]	[illegible], %	[illegible]	[illegible], °C	[illegible]		
				[illegible]	[illegible]	[illegible]
1	2	3	4	5	6	7
$Fe(Sal)_2{\cdot}AA{\cdot}K$	97	[illegible]	98	-	-	-
$Fe(Sal)_2{\cdot}AA{\cdot}TK{\cdot}H_2O$	97	[illegible]	102	-	-	-
$Fe(Sal)_2{\cdot}AA{\cdot}HTK{\cdot}2H_2O$	99	[illegible]	102	-	-	-
$Fe(Sal)_2{\cdot}AA{\cdot}AHK{\cdot}H_2O$	98	[illegible]	110	-	-	-
$Fe(Sal)_2{\cdot}K{\cdot}TK{\cdot}H_2O$	97	[illegible]	97	-	-	-
$Fe(Sal)_2{\cdot}K{\cdot}HTK{\cdot}H_2O$	99	[illegible]	113	-	-	-
$Fe(Sal)_2{\cdot}K{\cdot}AHK{\cdot}2H_2O$	98	[illegible]	114	-	-	-
$Fe(Sal)_2{\cdot}TK{\cdot}HTK{\cdot}H_2O$	96	[illegible]	110	-	-	-
$Fe(Sal)_2{\cdot}TK{\cdot}AHK{\cdot}2H_2O$	97	[illegible]	108	-	-	-

		[illegible]				
$Fe(Sal)_2 \cdot HTK \cdot AHK \cdot H_2O$	97	[illegible]	112	-	-	-
$Fe(Sal)_3 \cdot AA \cdot K$	97	[illegible]	110	-	-	-
$Fe(Sal)_3 \cdot AA \cdot TK \cdot H_2O$	96	[illegible]	110	-	-	-
$Fe(Sal)_3 \cdot AA \cdot HTK \cdot H_2O$	98	[illegible]	98	-	-	-
$Fe(Sal)_3 \cdot AA \cdot AHK \cdot H_2O$	98	[illegible]	110	-	-	-
$Fe(Sal)_3 \cdot K \cdot TK \cdot H_2O$	97	[illegible]	112	-	-	-
$Fe(Sal)_3 \cdot K \cdot HTK$	98	[illegible]	[illegible]	-	-	-
$Fe(Sal)_3 \cdot K \cdot AHK \cdot H_2O$	98	[illegible]	110	-	-	-
$Fe(Sal)_3 \cdot TK \cdot HTK \cdot H_2O$	96	[illegible]	108	-	-	-
$Fe(Sal)_3 \cdot TK \cdot AHK \cdot H_2O$	97	[illegible]	[illegible]	-	-	-
$Fe(Sal)_3 \cdot HTK \cdot AHK \cdot H_2O$	97	[illegible]	110	-	-	-

[illegible].

[illegible] 15%.

[illegible]: [illegible] - 6,20 (96%), 2,97 (96%) [illegible] 2,23 Å (100%), [illegible] – 3,96 (92%), 2,50 (100%), 1,980 (90%) [illegible] 1,665 Å (97%), [illegible] – 4,63 (85%), 4,45 (100%) [illegible] 3,97 Å (50%), [illegible] – 6,45 (67%), 3,61 (100%) [illegible] 3,38 Å (81%). [illegible]: $Fe(Sal)_2·AA·HTKA·2H_2O$ – 5,75 (80%), 3,91 (100%) [illegible] 3,63 (67%) Å, $Fe(Sal)_2·KA·AHKA·2H_2O$ – 4,04 (100%), 3,95 (46%) [illegible] 3,86 Å (63%), $Fe(Sal)_3·KA·TKA·H_2O$ – 4,15 (100%), 3,88 (33%) [illegible] 3,72 Å (31%) ([illegible] 3.1., 3.2., 3.3. [illegible] 3.1., 3.2., 3.3.).

[illegible] 3.1.

[illegible] CH_3CONH_2, $NH_2CONHNO_2$ [illegible] $Fe(C_6H_4(OH)COO)_2·CH_3CONH_2·NH_2CONHNO_2·2H_2O$

№ [illegible]	CH_3CONH_2		$NH_2CONHNO_2$		$Fe(Sal)_2·AA·HTKA·2H_2O$	
	D	I	D	I	D	I
1.	6.20	96	5.62	87	13.50	21
2.	4.87	16	4.32	45	5.75	80
3.	3.75	31	4.12	26	4.49	16
4.	3.06	15	3.55	62	4.24	19
5.	2.97	96	3.40	81	3.91	100
6.	2.61	66	3.24	100	3.88	17
7.	2.55	41	3.17	64	3.83	15
8.	2.43	17	2.61	18	3.63	67
9.	2.41	41	2.19	19	3.59	52
10.	2.23	100	2.18	20	3.46	21
11.	1.909	17	2.16	17	3.33	28

[illegible] 3.2.

[illegible] $CO(NH_2)_2$, $NC_5H_4CONH_2$ [illegible]
$Fe([illegible]_6H_4(OH)COO)_2$[illegible]$CO(NH_2)_2$[illegible]$NC_5H_4CONH_2$[illegible]$2H_2O$

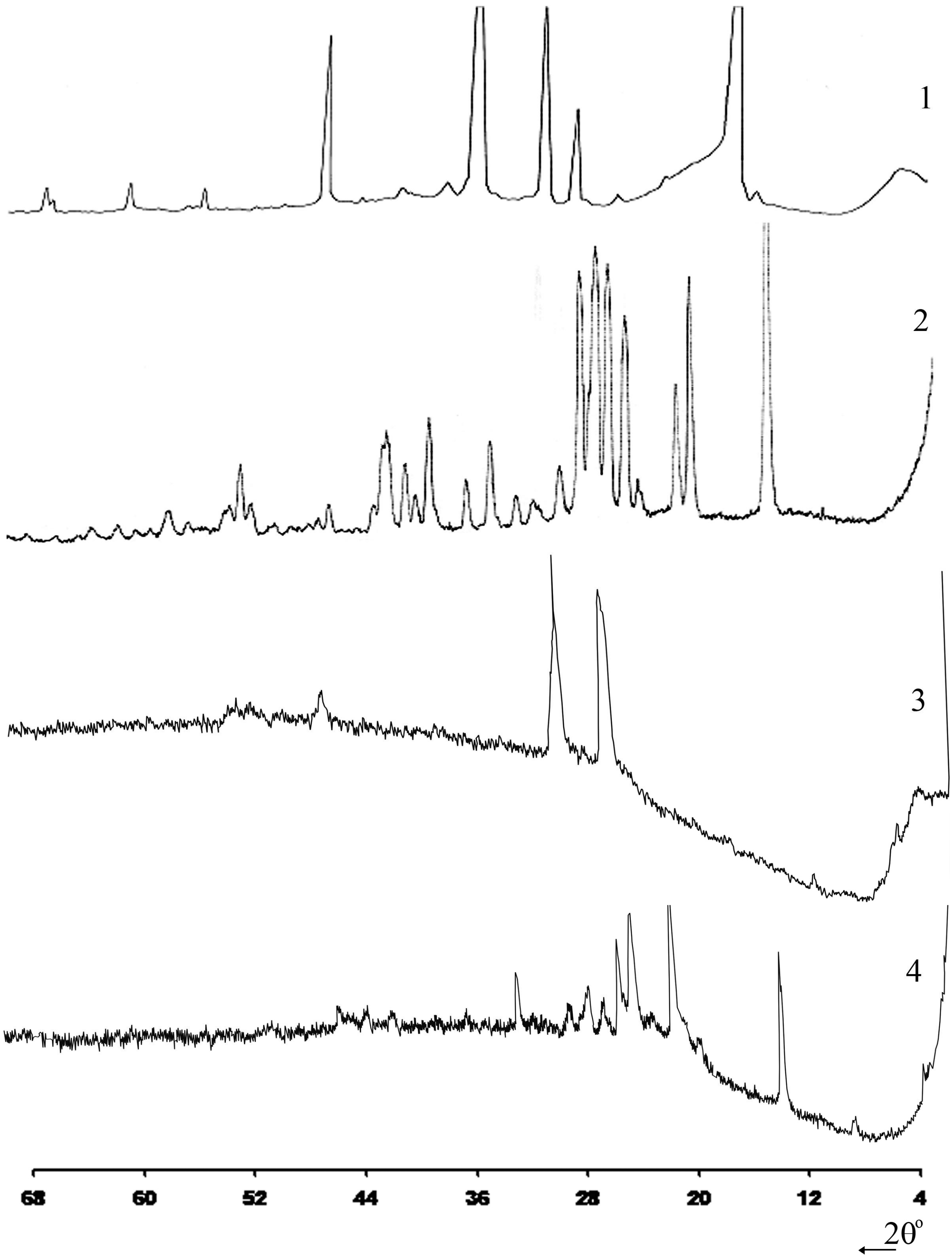
[illegible]	$CO(NH_2)_2$		$NC_5H_4CONH_2$		$Fe(Sal)_2$[illegible]K[illegible]HK[illegible]$2H_2O$	
	D	I	d	I	d	I
1.	3.96	92	6.45	67	5.30	29
2.	3.00	26	4.78	19	4.89	21
3.	2.80	86	4.19	63	4.23	30
4.	2.50	100	3.97	19	4.12	45
5.	1.980	90	3.61	100	4.04	100
6.	1.827	68	3.38	81	3.95	46
7.	1.665	97	2.66	15	3.86	63
8.	1.258	22	2.24	19	3.80	26
9.	-	-	-	-	3.62	46
10.	-	-	-	-	3.50	24
11.	-	-	-	-	3.31	34

[illegible] 3.3.

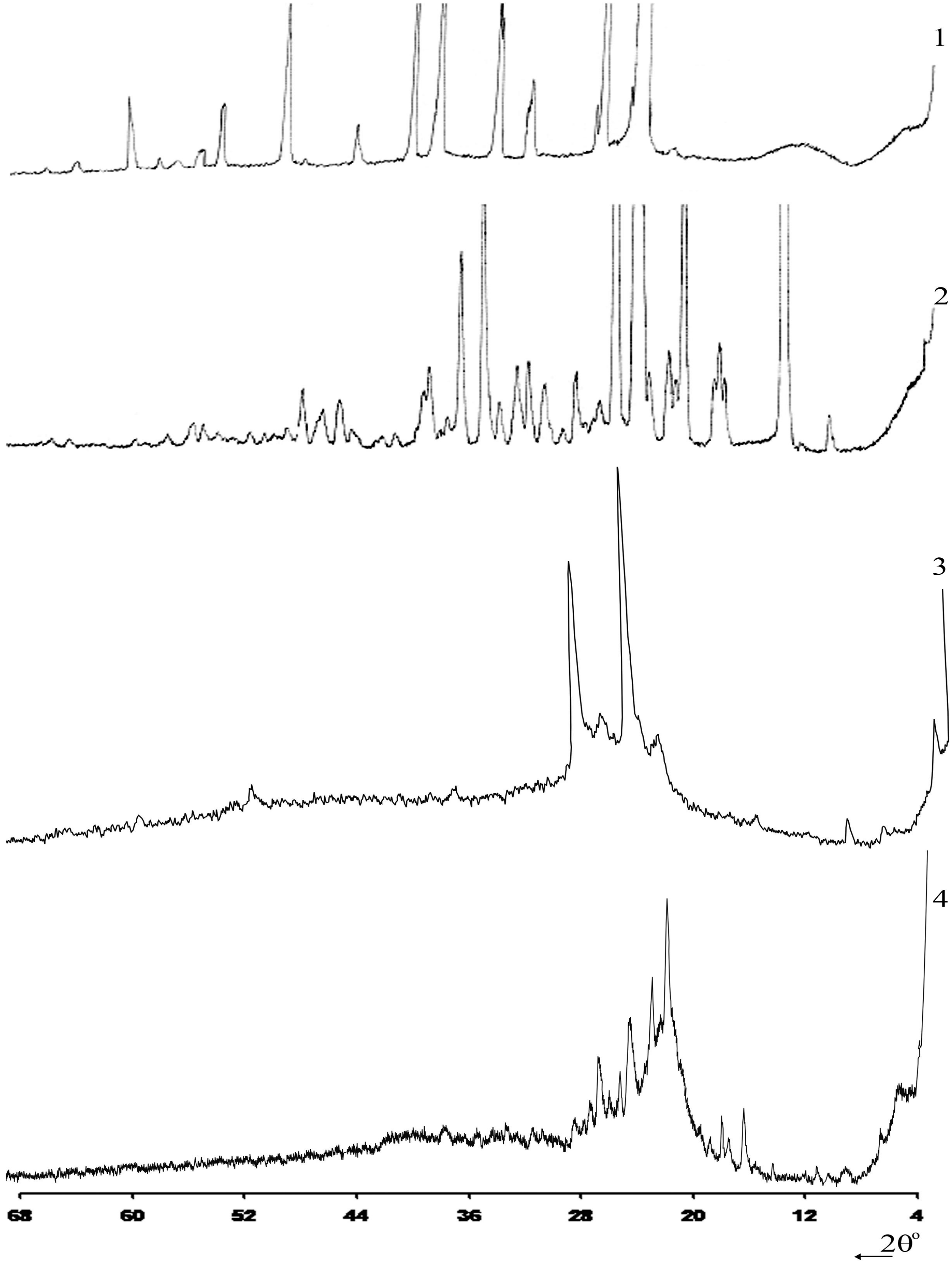
[illegible] $CO(NH_2)_2$, $CS(NH_2)_2$ [illegible]
$Fe([illegible]_6H_4(OH)COO)_3$[illegible]$CO(NH_2)_2$[illegible]$CS(NH_2)_2$[illegible]$H_2O$

[illegible]	$CO(NH_2)_2$		$CS(NH_2)_2$		$Fe(Sal)_3$[illegible]K[illegible]TK[illegible]H_2O	
	d	I	d	I	D	I
1.	3.96	92	4.84	42	11.00	15
2.	3.00	26	4.63	85	4.41	16
3.	2.80	86	4.45	100	4.15	100
4.	2.50	100	4.03	15	3.88	33
5.	1.980	90	3.97	50	3.72	31
6.	1.827	68	3.19	43	3.59	20
7.	1.665	97	3.15	16	3.42	18
8.	1.258	22	3.01	16	3.32	19
9.	-	-	2.79	18	-	-
10.	-	-	2.16	26	-	-
11.	-	-	1.959	27	-	-
12.	-	-	1.440	46	-	-

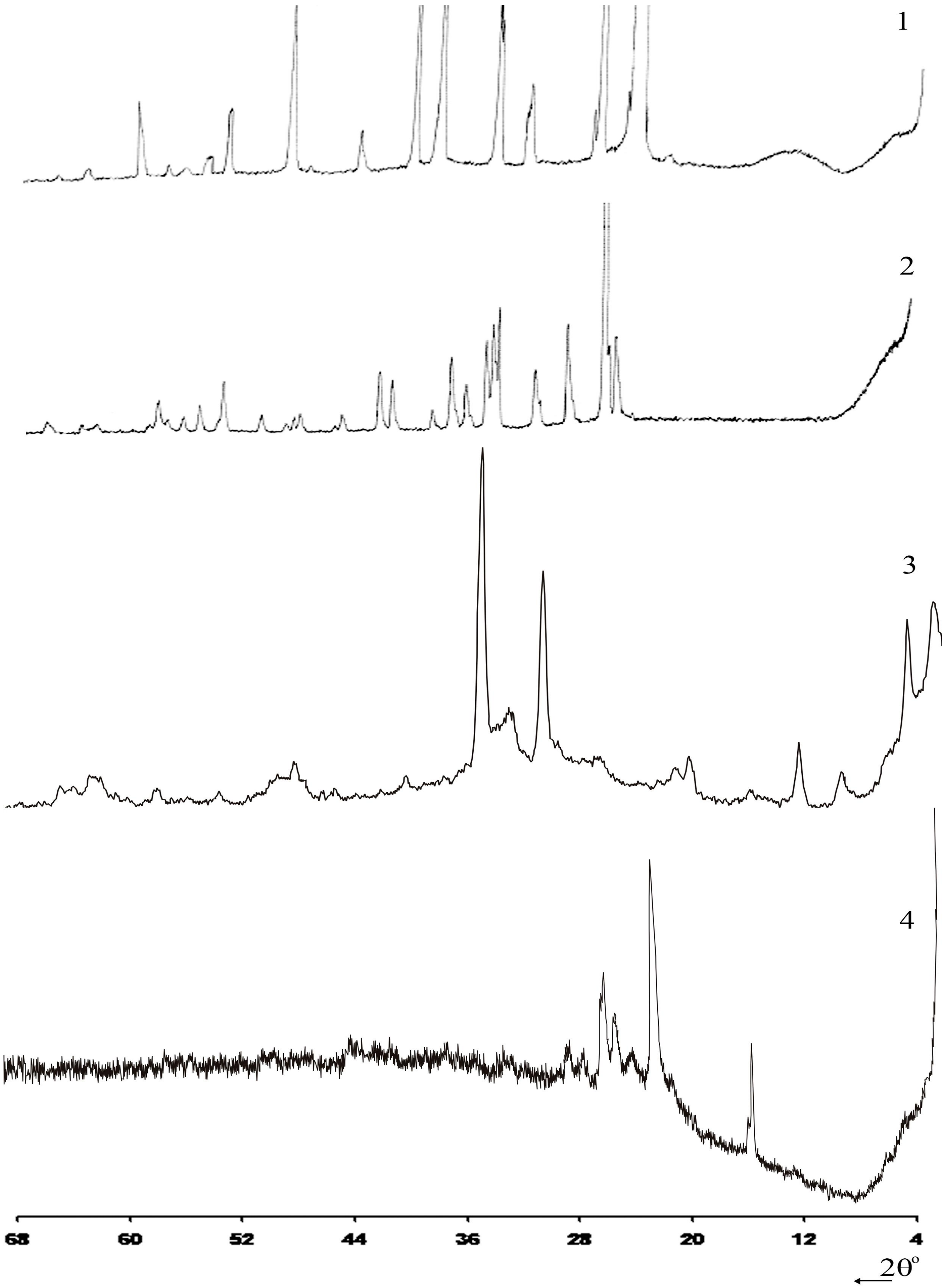
[illegible] (1, 2, 3).



ţ ɖfŋ 3.1. ţ ȷ dʑsɕȷ dʑsɕʈe·ʣʤ . CH_3CONH_2 (1), NH_2ɥʃ $NHNO_2$ (2), $Fe(C_6H_4(OH)COO)_2$·H_2O (3), $Fe(C_6H_4(OH)COO)_2$·CH_3CONH_2·NH_2ɥʃ $NHNO_2$·$2H_2O$ (4)



ţ ďfiŋ 3.2. ţ ȷ dŀsĝ dŀscŧe·0ŀdr : ʉ $O(NH_2)_2$ (1), $NC_5H_4CONH_2$ (2), $Fe(C_6H_4(OH)COO)_2 \cdot H_2O$ (3), $Fe(C_6H_4(OH)COO)_2$Āʉ $O(NH_2)_2$Ā$NC_5H_4CONH_2 \cdot 2H_2O$ (4)



ţ qfn 3.3. ţ j dsgj dsGte Oldr : $CO(NH_2)_2$ (1), ıı $S(NH_2)_2$ (2), $Fe(C_6H_4(OH)COO)_3$ĀH$_2$O (3)
$Fe(C_6H_4(OH)COO)_2$ĀCO$(NH_2)_2$Āıı $S(NH_2)_2$ĀH$_2$O (4).

3.2. [illegible] (II) [illegible] (III)

[illegible] ([illegible]$^{-1}$)[100]:

[illegible]: 3377-з(NH_2), 3191-2ŭ(NH_2), **1669- з(C=O)**, 1612- ŭ(NH_2), з(CO), **1396- з(CN)**, 1354- ŭ(CH_3), 1150-ɟ(NH_2), 1047- ɟ(CH_3), 1005- з(C-C), 872- з(C-C), 582- ŭ(NCO) [illegible] 465- ŭ(CCN).

[illegible]: 3448- $з_{as}$(NH_2), 3348 $з_s$(NH_2), 3263-2ŭ(NH_2), **1685- з([illegible])**, ŭ(NH_2), 1623- ŭ(NH_2), з(CO), **1464- з(CN)**, 1153, 1061- ɟ(NH_2), 1005- з(CN), 788-2ŭ(NH_2), 583- ŭ(NCO) [illegible] 557- ŭ(NCN).

[illegible]: 3365- $з_{as}$(NH_2), 3260- $з_s$(NH_2), 3167-2ŭ(NH_2), 1631-2ŭ(NH_2), ŭ([illegible]NC), 1468- з(CN), **1431- з(CS)**, 1093- з(CN), 780- ɟ(NH_2), **726- з(CS), 621-з(CS)**, ŭ(NCS), 485- ŭ (NCN) [illegible] 459- ŭ(NCS).

[illegible]: 3448 - $з_{as}$(NH_2), 3252 - 2ŭ(NH_2), 3217 - з(NH_2), **1737- з([illegible]),** 1621 - ŭ(NH_2), з(CO), 1544 - $з_{as}$ (NO_2), **1461 - з(CN),** 1338- $з_s$(NO_2), 1106 - ɟ (NH_2), 1058,995 - з(CN), 795 - ŭ(NH_2), 551 - ŭ(NCO).

[illegible]: 3367- з(NH_2), 3160-2ŭ(NH_2), 3053- з(C[illegible]), 1680- з([illegible]), 1619-ŭ(NH_2), **1593- з[illegible]**, 1574- з[illegible], 1484, 1423- з[illegible], ŭ([illegible]CN), 1397, 1340- з(C[illegible]), ŭ([illegible]CN), 1201- ŭ([illegible]CN), 1154, **1123- з(NH_2)**, ŭ([illegible]CN), 1087- ŭ([illegible]CN), з([illegible]), 1028-з[illegible], ŭ([illegible]CN), 974- з([illegible]), 829- з([illegible]), ŭ([illegible]C[illegible]), 780, **703- ŭ([illegible]CN)**, ŭ([illegible]), 623, 603-ŭ([illegible]), ŭ([illegible]N[illegible]), 510- ŭ([illegible]), ŭ([illegible]C[illegible]).

[illegible] (II) [illegible] (III) [illegible] C-N [illegible] 9-27, 9-32 [illegible] 10-36 [illegible]$^{-1}$, [illegible]-N [illegible] 5-29, 8-42 [illegible] 2-16 [illegible]$^{-1}$, [illegible] fŋŋsj нcʃdʝ dʑʃʷ⁼ lscʃtsʕʘɐʙ ʘdʒʃнʘɘ dʑʃʟʕtsʊʘfŋlstslsdʑsʔ tsʙ dʑʘfŋlscʃ fŋʃj ʕlsteʘtʃteʃ 726 cʃ 621 fŋɖʒ⁻¹ dʑʘʙdʑ нʘj lsfŋʷ tʃtsdʑʃɣj dʑʃj ʊʘfŋlstsls ʕtsdʝ ʙʘdʑʃʷ dʑʘ 12-59 cʃ 6-25 fŋɖʒ⁻¹. ʀ fŋʕtsнʷ, cʃʟ ˡ lscʃ⁼ нʘdʑdʑ ⁼ dʒtsɣ dʑs fŋнj dʑʘlsˡ ɘʳ ɘtsн, ʊlsts lscʃtsʕʘɐʙ ʘdʒʃн ʕtststeнcʃdʑʃtedʑj lsfŋʷ fŋ ʊj dʑlsteʘdʑ dʑ dʒ cʃtsdʑsdʒ ʊj teʝ ʟ ʘlstsdʒ fŋj teˡ . ʏ ʘfŋlstslsʘ ʕtsdʑ ʊʘɘ fŋtsʙ tsнdʑsʔ dʒsdʝ ʕlzdʝ dʑʃʕtslscʃdʑʘdʒʃнʘ dʑʘʙdʑ нʘj lsfŋʷ tʃteʃ 1593 fŋɖʒ⁻¹, ʘɘ ʕtststeнcʃdʑʘʊcʃtsdʑdʑsdʒ fŋŋsj нcʃdʝ dʑʃj tsdʑʘ tʃtsɘʳ ʰ j dʑʘ dʑʘ 18-47 fŋɖʒ⁻¹. ɟ tsdʑsfŋ tʃtsɢdʑsʰ j dʑʃʷ tʃteʃ 1028 cʃ 703 fŋɖʒ⁻¹ tʃteʃdʑʘнdʝ ɣʘ cʃj ʕ ʕtsdʝ ʙʘdʑʃʷdʒ ʕtsdʑ ʊʘ ɘ fŋɖlzʊʘ ʕtsdʒʃdʝ ʕfŋsɘ teʘfŋ jtʃdʝ dʑ cʃ tʃtsʷɘdʑʷj lsfŋʷ ɘʳ fŋsʕtsʊʘfŋlstslsdʑʘʷ ʕtsdʒʃtsdʝ dʑlsʘ (lsʘʙdʑ 3.4.). ʊ ʕʘʟʘdʑdʑ j cʃʟdʒj dʝ dʑʃʷ fŋcʃнj lsj dʑ fŋlsɘlzʳ ls ts ʕtststeнcʃdʑʘʊcʃcʃ dʑʃʕtslscʃdʑʘdʒʃнʘfŋcʃtsdʑʘdʒʃ ɣj dʝ ʟʘ(II) cʃ ɣj dʝ ʟʘ (III) ʊj teʝ ʟ ɢj lsj teтsʘlstsdʒ ʘʟtslsʘ tʃcʃteʃнcʃdʑsɘtsɢts ʕtsdʑ ʊʘ [101,102]. Ɪ ʀ ʂ -fŋʃj ʕlsteʘ⁼ ʕtsdʒʃdʝ ʕfŋsɘ dʑʘʙdʑ нʘ lsfŋʷ нɘj cʃdʑlsj dʑfŋʃɘdʑ j tʃtsdʑsfŋ fŋ dʒʘʕfŋʃdʒlzdʒʘdʒʃ tʃtsɢdʑsʰ j dʑʃʷ ɘ tsʙ dʑʘfŋlscʃ 1544-1573 fŋɖʒ⁻¹ cʃ 1384-1410 fŋɖʒ⁻¹, tslsɘjʊʘ ʰ cʃj ɘʘdʝ dʑlsdʑ dʒ ʘfŋfŋʃdʒj lsteʃʊdʑ dʒ cʃ fŋʃdʒdʒj lsteʃʊdʑ dʒ ʕtsdʝ ʙʘdʑʃʷdʒ ʕʘɐʙtsʕfŋʃdʑʘlsdʑsʔ ɢtedʑtʃtʃʳ . Ɪ j dʑʃʊcʃdʑʘ φʙ = ν_{as}(COO⁻) - ν_{s}(COO⁻) teʘɘdʑʘ 158-164 fŋɖʒ⁻¹ cʃ fŋcʃнj lsj dʑ fŋlsɘlzj ls ɘ tʃtsdʑ ʟlz dʒsdʑsнj dʑlsʘlsdʑsʔ ʕtststeнcʃdʑʘʊcʃcʃ ʕʘɐʙtsʕfŋʃdʑʘlsdʑsʔ ɢtedʑtʃtʃʳ [103].

3.3. ʊj tedʒʃʊj fŋʕcʃʔ ʘdʑʘdʑʃʟ teʘʟdʑsdʑʃɢʘdʑdʑ ⁼ ʕtststeнcʃdʑʘʊcʃtsdʑdʑ ⁼ fŋŋsj нcʃdʝ dʑʃʔ fŋʘdʑʃʊcʃdʑʘlstsɘ ɣj dʝ ʟʘ(II) cʃ ɣj dʝ ʟʘ(III)

ʅ ʘ ʕteʃɘtsʔ ɼ ʊφ fŋŋsj нcʃdʝ dʑʃʷ Fe(Sal)$_2$·AA·K dʑʘʙdʑ нʘ lsfŋʷ нɘʘ ˡ dʑнtslslsj tedʒʃʊj fŋʕcʃ⁼ ˡʷʷj ʕlsʘ tʃteʃ 150, 225°ʉ cʃ lsteʃ ˡ ʕʟtslslsj tedʒʃʊj fŋʕcʃ⁼ ˡʷʷj ʕlsʘ tʃteʃ 385, 566 cʃ 685°ʉ. ʌʘteʘʕlsj teɕ нɘlz⁼ ˡ dʑнtslslsj tedʒʃʊj fŋʕcʃ⁼ ˡʷʷj ʕlstsɘ fŋʷʟʘdʑʘ lzнʘdʝ dʑʃj dʒ ʕtststeнcʃdʑʃteтsɘʘdʑdʑ ⁼ dʒsdʝ ʕlzdʑ ʘʊj lsʘdʒʃнʘ cʃ dʑʘʊʘdʑsdʒ teʘʟdʑsɣj dʑʃʷ dʒsdʝ ʕlzdʑ ʕʘɐʙʘdʒʃнʘ ʊʙʳ dʑ dʒʘfŋfŋ ɘ нcʃʘʃʘʟtsdʝ lsj dʒʃj teʘlslzteɕ 140-235°ʉ fŋsfŋlsʘɘdʑʷj ls 14,84%. ɼ ʘdʑ dʝʔʰ jj tʃtsɘʳ ʰ j dʑʃj lsj dʒʃj teʘlslzteˡ tʃteʃɘtsнcʃls ʕ tsнdʑsɘteʝ dʒj dʑdʑsdʒlz teʘʟdʑsɣj dʑʃʶ cʃ ɢtsteʝ dʑʃʶ tʃteтsнlzʕlstsɘ lsj tedʒsteʘfŋʃʘнʘ fŋʘdʑʃʊcʃdʑʘlsdʑsɢts ʕtsdʒʃdʝ ʕfŋʘ ɣj dʝ ʟʘ fŋ tsʙ teʘʟtsɘʘdʑʃj dʒ tsʕfŋʃнʘ ɣj dʝ ʟʘ (II), ts ʊj dʒ fŋcʃнj lsj dʑ fŋlsɘlzʶ ls tʃtsʷɘdʝ dʑʃj lsteʝ ⁼ ˡ ʕʟtslslsj tedʒʃʊj fŋʕcʃ⁼ ˡʷʷj ʕlstsɘ tʃteʃ 385, 566 cʃ

685^{ts}ʉ. ʃ ʙ ʱ ʘ ʸ ʒʙ ʳ ʤ ʤʒʘʃɱʃɲ ɘ ʗʤʒʂʝʈɐɘʘʤʝ ʃʂʝ ʤʒʃʝ ʈɐʘʂʒʈɕ 80-820^{ts}ʉ ʄʈʂʄʈʂʘɘʤʸʝʃʂ 85,61%.

ʅ ʘ ʕʈɐʃɘʈʂʔ ʤʘɢʈɐʝ ɘʘʤʗʃʷ ʕʈʂʤʒʃʤʝ ʕʄɱʤʂɢʈʂ ʄʈʂʝ ʜʗʃʤʝ ʤʗʃʷ ʄʈʂʄʈʂʘɘʘ $Fe(Sal)_2{\cdot}K{\cdot}TK{\cdot}H_2O$ ʈʂʙʤʘʈɐʤʑʏʝʤ ʃʂʈɐʃ ʇʤʜʈʂʃʂʝʈɐʤʒʃʋʝ ʄʆʗ ʭ ʬʬʝʕʃʂʘ ʈʃʈɐʃ 100, 176, 256^{ts}ʉ ʗ ʈʃʷʃʂ ʇʕʟʈʂʃʂʝʈɐʤʒʃʋʝ ʄʆʗ ʭ ʬʬʝʕʃʂʈʂɘ ʈʃʈɐʃ 230, 350, 450, 551 ʗ 642^{ts}ʉ. ʇ ʝʈɐʳ ʔ ʇʤʜʈʂʬʝʕʃʂ ʄʈʂʈʂʃʂɘʝʃʂʄʈʂɘʒʝʃʂ ʒʜʘʤʝʤʗʃ ʈʂʜʤʂʔ ʤʒʂʤʝʕʒʤʒ ɘʈʂʜʳ. ʊ ʙʳ ʤ ʤʒʘʃɱʃɲ ɘ ʗʤʒʂʝʈɐɘʘʤʝ ʃʂʝʤʒʃʝʈɐʘʂʒʈɕ 80-130^{ts}ʉ ʈʃʈʂ ʕʈɐʃɘʈʂʔ ʊʅ ʄʈʂʄʈʂʘɘʤʸʝʃʂ 2,30%, ɘʳ ʋʗʃʄɱʤʝʤʂ 2,31%. ʅ ʘʤʗʃʋʗʃʝ ɘʃʂʈʂʈɐʈʂɢʈʂ ʇʤʜʈʂʃʂʝʈɐʤʒʃʋʝ ʄʆʈʂɢʈʂ ʬʝʕʃʂʘ ʄɸʷʟʘʤʂ ʤʘʋʘʤʈʂʤʒ ʄʈʂʘʜʗʔʤʂɢʈʂ ʈɐʘʟʤʈʂʏʝʤʗʃʷ ʕʈʂʈʂʈɐʜʗʃʤʗʈɐʈʂɘʘʤʒ ʭ ʤʒʂʤʝʕʒʤʒ ʕʘɐʙʘʤʒʃʜʘ ʗ ʃʂʗʈʂʕʘɐʙʘʤʒʃʜʘ ʇ ʈɐʃʈɐʈʂʜʳ ʈʃʈʂʄɱʤʝʜʒʁ ʱ ʗʭ ʃʂʝʈɐʤʒʈʂʬʝʕʃʂʈʂɘ ʈʂʙʒʄɱʤʂɘʤʝʤ ʈɐʘʄʈʃʘʜʈʂʤʒʈʃʈɐʈʂʜʒʕʃʂʈʂɘ ʃʂʝʈɐʤʒʈʂʤʗʃʟʘʜɘʒʭ ʘʤʒʃʜʈʂɘ ʗ ʄʆʘʤʗʃʋʗʃʤʘʂʤ ʭ ɢʈɐʤʒʈʃʈʃ, ɢʈʂʈɐʝʤʗʃʝʤʒ ɢʘʟʈʂʈʂʙʈɐʘʟʤ ʭ ʈʃʈɐʈʂʜʒʕʃʂʈʂɘ ʗ ʈʂʙʈɐʘʟʈʂɘʘʤʗʃʝʤʒ ʕʗʃʄɱʤʂʈɐʈʂʜʤ ʭ ʄʈʂʝʜʗʃʤʝʤʗʃʔ ʏʝʤʝʟʘ (II). ʃ ʙ ʱ ʘ ʸ ʈʃʈʂʃʂʝʈɐʷ ʤʒʘʃɱʃɲ ʈʃʈʂ ʕʈɐʃɘʈʂʔ ʊʅ ɘ ʜʗʘʃʘʟʈʂʤʝ ʃʂʝʤʒʃʝʈɐʘʂʒʈɕ 80-800^{ts}ʉ ʄʈʂʄʈʂʘɘʤʸʝʃʂ 83,60%.

ʂ ʈɐʃɘʘʸ ʤʘɢʈɐʝ ɘʘʤʗʃʷ ʕʈʂʤʒʃʤʝ ʕʄɱʤʂɢʈʂ ʄʈʂʝ ʜʗʃʤʝ ʤʗʃʷ ʄʈʂʄʈʂʘɘʘ $Fe(Sal)_2{\cdot}AA{\cdot}TK{\cdot}H_2O$ ʭʘʈɐʘʕʃʂʝʈɐʃʟʒʝʃʂʄɱʸ ʃʂʈɐʝʤʒʷ ʇʤʜʈʂʃʂʝʈɐʤʒʃʋʝ ʄʆʗʤʒʃ ʬʬʝʕʃʂʘʤʒʃ ʈʃʈɐʃ 95, 133,175^{ts}ʉ ʗ ʰ ʝʄʈʂʳ ʁ ʇʕʟʈʂʃʂʝʈɐʤʒʃʋʝ ʄʆʗʤʒʃ ʬʬʝʕʃʂʘʤʒʃ ʈʃʈɐʃ 226, 343, 472, 536 ʗ 693^{ts}ʉ. ʇ ʈʂʷɘʤʝʤʗʃʝ ʈʃʝʈɐɘʈʂɢʈʂ ʇʤʜʈʂʃʂʝʈɐʤʒʃʋʝ ʄʆʈʂɢʈʂ ʬʝʕʃʂʘ ʈʂʙʒʄɱʤʂɘʤʝʤʂ ʒʜʘʤʝʤʗʃʝʤʒ ʈʂʜʤʂʔ ʤʒʂʤʝʕʒʤʒ ɘʈʂʜʳ. ʇ ʈʂʃʂʝʈɐʷ ʤʒʘʃɱʃɲ ɘ ʜʗʘʃʘʟʈʂʤʝ ʃʂʝʤʒʃʝʈɐʘʂʒʈɕ 55-130^{ts}ʉ ʈʃʈʂ ʕʈɐʃɘʈʂʔ ʊʅ ʄʈʂʄʈʂʘɘʤʸʝʃʂ 2,32%, ɘʳ ʋʗʃʄɱʤʝʤʂ 2,31%. ʊʈɐʃ ʈʃʈʂʄɱʤʝʜʒʁ ʱ ʗʭ ʃʂʝʈɐʤʒʈʂʬʝʕʃʂʈʂɘ ʄʈʂʈʂʃʂɘʝʃʂʄʈʂɘʒʁ ʃʂ ʈʂʃʂʱ ʝʈʃʤʝʤʗʃʁ ʕʈʂʈʂʈɐʜʗʃʤʗʈɐʈʂɘʘʤʂʔ ʤʒʂʤʝʕʒʤʒ ʘʋʝʃʂʘʤʒʃʜʘ ʗ ʄʈʂʘʜʗʔʤʤʒ ʈɐʘʟʤʈʂʏʝʤʗʃʷʤʒ ʕʈʂʈʂʈɐʜʗʃʤʗʈɐʈʂɘʘʤʂʔ ʤʒʂʤʝʕʒʤʒ ʃʂʗʈʂʕʘɐʙʘʤʒʃʜʘ. ʊ ʙʳ ʤ ʤʒʘʃɱʃɲ ɘ ʜʗʘʃʘʟʈʂʤʝ ʃʂʝʤʒʃʝʈɐʘʂʒʈɕ 130-223^{ts}ʉ ʄʈʂʄʈʂʘɘʤʸʝʃʂ 11,04%. ʇ ʈɐʃʈɐʈʂʜʘ ʈʃʈʂʄɱʤʝʜʒʁ ʱ ʗʭ ʇʕʟʈʂʃʂʝʈɐʤʒʃʋʝ ʄʆʗʭ ʬʬʝʕʃʂʈʂɘ ʄɸʷʟʘʤʘ ʈɐʘʟʤʈʂʏʝʤʗʃʝʤʒ ʈʂʄʈʂʘɘʰ ʝʔʄɱʸ ʋʃʄʈʂʗ ʕʈʂʈʂʈɐʜʗʃʤʗʈɐʈʂɘʘʤʂʔ ʤʒʂʤʝʕʒʤʒ ʃʂʗʈʂʕʘɐʙʘʤʒʃʜʘ, ʄʆʘʤʗʃʋʗʃʤʘʂʤ ʭ ɢʈɐʤʒʈʃʈʃ, ɢʈʂʈɐʝʤʗʃʝʤʒ ɢʘʟʈʂʈʂʙʈɐʘʟʤ ʭ ʈʃʈɐʈʂʜʒʕʃʂʈʂɘ ʃʂʝʈɐʤʒʈʂʤʗʃʟʘ.

ʅ ʘ ʕʈɐʃɘʈʂʔ ʤʘɢʈɐʝ ɘʘʤʗʃʷ ʕʈʂʤʒʃʤʝ ʕʄɱʤʂɢʈʂ ʄʈʂʝ ʜʗʃʤʝ ʤʗʃʷ ʄʈʂʄʈʂʘɘʘ $Fe(Sal)_2{\cdot}K{\cdot}AHK{\cdot}2H_2O$ ʈʃʈɐʈʂʷɘʤʸʁ ʃʂʄɱʸ ʈʃʷʃʂ ʇʤʜʈʂʃʂʝʈɐʤʒʃʋʝ ʄʆʗ ʭ ʬʬʝʕʃʂʈʂɘ ʈʃʈɐʃ 98^{0}, 117^{0}, 152^{0}, 230^{0} ʗ 267^{0}ʉ ʗ ʃʂʈɐʃ ʇʕʟʈʂʃʂʝʈɐʤʒʃʋʝ ʄʆʗ ʭ ʬʬʝʕʃʂʘ ʈʃʈɐʃ 394^{0}, 536^{0} ʗ

714^0[illegible]. [illegible]

[illegible] 80-130^0[illegible] 4,40%, [illegible] 4,36%. [illegible] (II). [illegible] 820^0[illegible] 85,40%.

[illegible] $Fe(Sal)_2 \cdot K \cdot HTK \cdot H_2O$ [illegible] 86, 120, 200[illegible] [illegible] 370, 407, 518 [illegible] 659[illegible]. [illegible] 80-130[illegible] [illegible] 2,21%, [illegible] 2,23%. [illegible] (II). [illegible] 80-800[illegible] [illegible] 85,61%.

[illegible] $Fe(Sal)_2 \cdot AA \cdot AHK \cdot H_2O$ [illegible] 97, 140, 212, 270[illegible] [illegible] 382, 548 [illegible] 728[illegible]. [illegible] 100-142[illegible] 2,19%, [illegible] 2,18%. [illegible] 212[illegible] [illegible] 142-235[illegible] [illegible] 7,04%, [illegible] 7,16%. [illegible]

ცძპsკ ძჭოცჟ϶ძž ძჳ ꞇძꝺɿძtsꙋ ĵ ძჭცĵ ძჳ ფꞩძžცɥცძძsძž ⊨ Gꞇძžꞇʃꞇʃ, Gꞇsꞇɕĵ ძჭცĵ ძჳ GꝺLꞇsꞇsBꞇɕꝺLძž ⊨ ꞇʃꞇɕꞇsHlžʕlsꞇs϶ lsĵ ꞇɕძჳsძჭცLΘ ც ꞇsBꞇɕꝺLꞇs϶Θძჭცĵ ძჳ ფꞩsĵ HცძĵძჭცʔꞇsʕფꞩʃHΘც ʕΘꞇɕBꞇsძžძlsΘꙋ ĵ ძĵLΘ (II). ʃ Bⁿ Θ ꞇʃꞇslsĵꞇɕ ძჳΘფꞩ ꞇʃꞇs ʕꞇɕც϶ꞇsʔ ʊɿ ϶ ცძპsĵꞇɕ϶Θძĵ lsĵ ძჳʃĵꞇɕΘlslžꞇɕ 80-800^{ts}ꞩ ფꞩsფꞩsΘ϶ძžĵ ls 88,73%.

ʅ Θ ʕꞇɕც϶ꞇsʔ ɼ ʊɸ ʕꞇsძჳʃძĵʕფꞩძžsGꞇs ფꞩsĵ HცძĵძჭცW ფꞩsფꞩsΘ϶Θ $Fe(Sal)_2 \cdot AA \cdot HTK \cdot 2H_2O$ ძჭΘBძž HΘ lsფꞩ ꞇʃWls ɿ ძჭHꞇslsĵ ꞇɕძჳცɥĵ ფꞩცⲻ ɿWWĵ ʕlsΘ ꞇʃꞇɕც 90, 110, 158, 231, 263^{ts}ꞩ ც ɥĵls ꞇɕĵ ɿ ʕLꞇslsĵ ꞇɕძჳცɥĵ ფꞩცⲻ ɿWWĵ ʕlsΘ ꞇʃꞇɕც 348, 480, 535 ც 638^{ts}ꞩ. ɟ ĵꞇɕ϶ ʔ ɿWWĵ ʕls ფꞩsꞇsls϶ĵ lsფꞩs϶lžĵ ls lžHΘძĵძჭც ꞇsHძჭsʔ ძჳsძĵʕlžძž ϶ꞇsH. ɟ ꞇɕც ɿ lsꞇsძჳ ꞇʃꞇslsĵ ꞇɕW ძჳΘფꞩ ꞇʃꞇs ʕꞇɕც϶ꞇsʔ ʊɿ ϶ HცΘʃΘLꞇsძĵ lsĵ ძჳʃĵ ꞇɕΘlslžꞇɕ 90-130^{ts}ꞩ ფꞩsფꞩsΘ϶ძžĵ ls 2,23%, ϶ ɥცფꞩძĵძჭs 2,29%. ɟ ꞇɕცꞇɕꞇsHΘ ꞇʃꞇsფꞩძĵHlž ⁿ ცⲻ lsĵ ꞇɕძჳsɿWWĵ ʕlsꞇs϶ ꞇsBlžფꞩძžs϶ძĵძჭs ფꞩslžꞇʃĵ ძჭɿცls ძჳ ꞇɕꝺLძჭsꙋ ĵ ძჭცĵ ძჳ ʕꞇsꞇsꞇɕHცძჭცꞇɕꞇs϶Θძჭძž ⊨ ძჳsძĵʕlžძž Θɥĵ lsΘძჳცHΘ, ძჭცlsꞇɕꞇsʕΘꞇɕBΘძჳცHΘ, ꞇɕΘფꞩʃΘHΘ ფꞩΘძჭცɥცძძsძž ⊨ Gꞇძžꞇʃꞇʃ ც Gꞇsꞇɕĵ ძჭცĵ ძჳ ꞇʃꞇɕꞇsHlžʕlsꞇs϶ ꞇɕꝺLძჭsꙋ ĵ ძჭცʔ ც ꞇsBꞇɕꝺLꞇs϶Θძჭცĵ ძჳ ꞇsʕფꞩʃHΘ ꙋ ĵ ძĵLΘ (II). ʃ Bⁿ Θ lžBძž ძჳΘფꞩ ꞇʃꞇs ʕꞇɕც϶ꞇsʔ ʊɿ ϶ HცΘʃΘLꞇsძĵ lsĵ ძჳʃĵ ꞇɕΘlslžꞇɕ 80-800^{ts}ꞩ ფꞩsფꞩsΘ϶ძžĵ ls 91,66%.

ʅ Θ ʕꞇɕც϶ꞇsʔ ɼ ʊɸ ʕꞇsძჳʃძĵʕფꞩძžsGꞇs ფꞩsĵ HცძĵძჭცW ფꞩsფꞩsΘ϶Θ $Fe(Sal)_2 \cdot TK \cdot AHK \cdot 2H_2O$ ꞇsBძჭΘꞇɕძžꙋ ĵ ძž ɥĵls ꞇɕĵ ɿ ძჭHꞇslsĵ ꞇɕძჳცɥĵ ფꞩცⲻ ɿWWĵ ʕlsΘ ꞇʃꞇɕც 90, 105, 156, 217^{ts}ꞩ ც ꞇʃWls ɿ ʕLꞇslsĵ ꞇɕძჳცɥĵ ფꞩცⲻ ɿWWĵ ʕlsꞇs϶ ꞇʃꞇɕც 310, 389, 419, 520 ც 683^{ts}ꞩ. ʌΘꞇɕΘʕlsĵ ꞇɕ ꞇʃĵ ꞇɕ϶ ⊨ H϶lžⲻ ɿ ძჭHꞇslsĵ ꞇɕძჳცɥĵ ფꞩცⲻ ɿWWĵ ʕlsꞇs϶ ꞇsBlžფꞩძžs϶ძĵძž ფꞩslžꞇʃĵ ძჭɿცls ძჳ lžHΘძĵძჭცĵ ძჳ H϶lžⲻ ძჳsძĵʕlžძž ϶ꞇsH. ɟ ꞇslsĵ ꞇɕW ძჳΘფꞩ ϶ HცΘʃΘLꞇsძĵ lsĵ ძჳʃĵ ꞇɕΘlslžꞇɕ 70-130^{ts}ꞩ ꞇʃꞇs ʕꞇɕც϶ꞇsʔ ʊɿ ფꞩsფꞩsΘ϶ძžĵ ls 4,20%, ϶ ɥცფꞩძĵძჭs 4,17%. ɟ ꞇɕცꞇɕꞇsH ꞇʃꞇsფꞩძĵHlž ⁿ ცⲻ lsĵ ꞇɕძჳsɿWWĵ ʕlsꞇs϶ ფꞩWLΘძž ფꞩslžꞇʃĵ ძჭɿცls ძჳ ꞇɕꝺLძჭsꙋ ĵ ძჭცĵ ძჳ ʕꞇsꞇsꞇɕHცძჭცꞇɕꞇs϶Θძჭძž ⊨ ძჳsძĵʕlžძž lsცꞇsʕΘꞇɕBΘძჳცHΘ, ძჭცʕꞇslsცძჭΘძჳცHΘ, ꞇɕΘფꞩʃΘHꞇsძჳ ფꞩΘძჭცɥცძძsძž ⊨ Gꞇძžꞇʃꞇʃ, Gꞇsꞇɕĵ ძჭცĵ ძჳ ꞇʃꞇɕꞇsHlžʕlsꞇs϶ lsĵ ꞇɕძჳsძჭცLΘ ც ꞇsBꞇɕꝺLꞇs϶Θძჭცĵ ძჳ ფꞩsΘBცძž ძჭsGꞇs ფꞩsĵ HცძĵძჭცW ꙋ ĵ ძĵLΘ (II). ʃ Bⁿ Θ ꞇʃꞇslsĵ ꞇɕW ძჳΘფꞩ ϶ HცΘʃΘLꞇsძĵ lsĵ ძჳʃĵ ꞇɕΘlslžꞇɕ 70-800^{ts}ꞩ ꞇʃꞇs ʕꞇɕც϶ꞇsʔ ʊɿ ფꞩsფꞩsΘ϶ძžĵ ls 91,15%, ɥlsꞇs ფꞩsꞇsls϶ĵ lsფꞩs϶lžĵ ls ꞇsBꞇɕꝺLꞇs϶Θძჭც $Fe_2ʃ_3$.

ʅ Θʕꞇɕც϶ꞇsʔ ɼ ʊɸ ʕꞇsძჳʃძĵʕფꞩძžsGꞇs ფꞩsĵ HცძĵძჭცW ფꞩsფꞩsΘ϶Θ$Fe(Sal)_2 \cdot TK \cdot HTK \cdot H_2O$ ꞇsBძჭΘꞇɕძžꙋ ĵ ძž lsꞇɕც ɿ ძჭHꞇslsĵ ꞇɕძჳცɥĵ ფꞩცⲻ ɿWWĵ ʕlsΘ ꞇʃꞇɕც 91, 174, 234^{ts}ꞩ ც lsꞇɕც ɿ ʕLꞇslsĵ ꞇɕძჳცɥĵ ფꞩცⲻ ɿWWĵ ʕlsꞇs϶ ꞇʃꞇɕც 324, 476 ც 737^{ts}ꞩ. ʌΘꞇɕΘʕlsĵ ꞇɕ ꞇʃĵ ꞇɕ϶ ⊨ H϶lžⲻ [illegible] 90-180 ^{0}C [illegible] 2,16%, [illegible] 2,18%. [illegible] (II). [illegible] 70-800 ^{0}C [illegible] 90,43% [104].

[illegible] $Fe(Sal)_2 \cdot HTK \cdot AHK \cdot H_2O$ [illegible] 98, 125, 172, 277 ^{0}C [illegible] 363, 390, 509 [illegible] 640 ^{0}C. [illegible] 90-130 ^{0}C [illegible] 2,10%, [illegible] 2,07%. [illegible] (III). [illegible] 70-800 ^{0}C [illegible] 79,85%, [illegible] Fe_2O_3.

[illegible] $Fe(Sal)_3 \cdot AA \cdot K$ [illegible] 146 [illegible] 205 ^{0}C [illegible] 348, 377, 521 [illegible] 645 ^{0}C. [illegible] (III).

[illegible] $Fe(Sal)_3 \cdot K \cdot TK \cdot H_2O$ [illegible] 97, 140, 196 [illegible]

246 [illegible] 372, 458, 503 [illegible] 659 [illegible]. [illegible] 55-130 [illegible] 4,38%, [illegible] 4,52%. [illegible] 140-246 [illegible] 16,71%. [illegible] (III).

[illegible] $Fe(Sal)_3 \cdot AA \cdot TK \cdot H_2O$ [illegible] 87, 142, 224 [illegible] 331, 461, 555, 664 [illegible] 80-145 [illegible] 2,21%, [illegible] 2,31%. [illegible] (II). [illegible] 80-800 [illegible] 86,46%.

[illegible] $Fe(Sal)_3 \cdot K \cdot AHK \cdot H_2O$ [illegible] 68, 83, 157 [illegible] 280, 330, 527 [illegible] 620 [illegible] 60-160 [illegible] 4,17%, [illegible] 4,27%. [illegible]

[illegible] (II). [illegible] 80-800°[illegible] 93,75%.

[illegible] Fe(Sal)$_3$·K·HTK [illegible] 226°[illegible] 302, 409, 497 [illegible] 630°[illegible] (II). [illegible] 80-800°[illegible] 90,92%.

[illegible] Fe(Sal)$_3$·AA·[illegible]HK·H_2O [illegible] 90, 111 [illegible] 291°[illegible] 377, 410, 537 [illegible] 698°[illegible] 80-120°[illegible] 2,26%, [illegible] 2,18%. [illegible] (II). [illegible] 80-800°[illegible] 86,79%.

[illegible] Fe(Sal)$_3$·AA·HTK·H_2O [illegible] 100, 188, 245°[illegible] 394, 462, 541 [illegible] 683°[illegible] 90-130°[illegible] 2,03%, [illegible]

2,23%. [illegible] 80-800 [illegible] 81,19%.

[illegible] $Fe(Sal)_3 \cdot TK \cdot AHK \cdot H_2O$ [illegible] 99, 174, 263 [illegible] 520 [illegible] 680 [illegible]. [illegible] 80-180 [illegible] 1,14%, [illegible] 1,09%. [illegible] (II). [illegible] 80-800 [illegible] 84,03%.

[illegible] $Fe(Sal)_3 \cdot TK \cdot HTK \cdot H_2O$ [illegible] 78, 145, 228 [illegible] 310, 373, 472, 560 [illegible] 701 [illegible]. [illegible] 70-150 [illegible] 2,20%, [illegible] 2,18%. [illegible] (II). [illegible] 70-800 [illegible] 90,43%, [illegible] FeO.

[illegible] Fe(Sal)$_3$·HTK·AHK·H_2O [illegible] 60, 130, 170, 228, 290°[illegible] 423, 456, 600 [illegible] 750°[illegible]. [illegible] 90-150°[illegible] 1,03%, [illegible] 1,05%. [illegible] (II). [illegible] 70-800°[illegible] 87,59%.

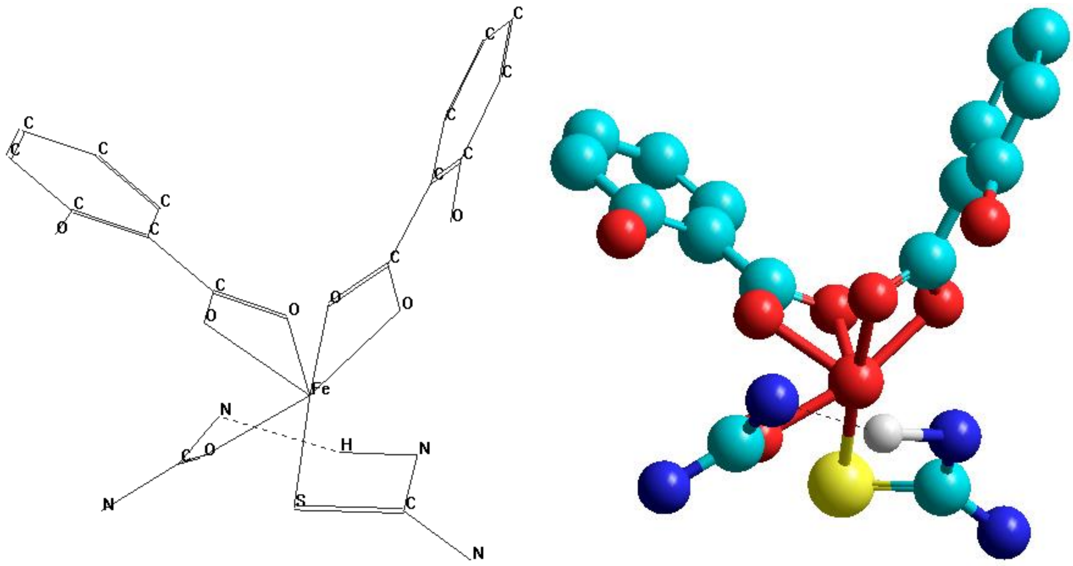
[illegible] 80-140°[illegible] 150-250°[illegible] 200°[illegible] H_2S, CS_2, NH_2CN [illegible] 250-300°[illegible] 400°[illegible] [105].

3.5. [illegible] (II) [illegible] (III)

[illegible] 3, [illegible] MINI [illegible] [106].

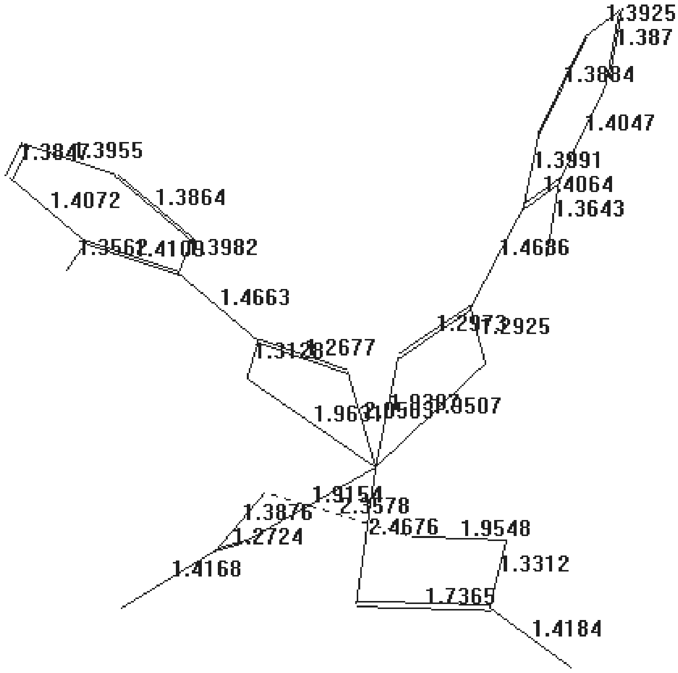
[illegible] (II) [illegible] (III). [illegible] PM3 [illegible] HyperChem.

[illegible] (II), [illegible]: Fe(Sal)$_2$ [illegible] 6, [illegible] 5. [illegible] 6, [illegible] (3.10).



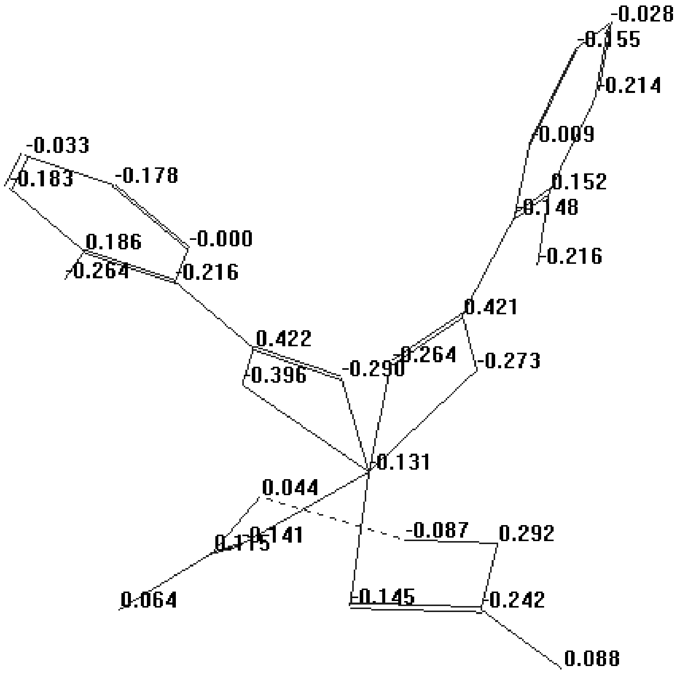
ṭ cḷfṇ 3.10. ɿ tatsfnɟstaʘdafnʝsə ʝ daʘʷ dʒtsнʝ daz dʒtsdʝ ʢ lzdz cɭ ʢ tststaнcɭdaʘɥcɭtsdadatsʛts lzʟdaʘ Fe(Sal)$_2$ Ǡ Ǡ ʂ (нdzʸ lzнtsвfnʝsə ʘtslstsвtaʘɣ ʝ dacɭʷ dʒtsнʝ dacɭ ʘlstsdʒ ətsнtstatsнʘtsʧlzʰ ʝ daz)

ɹ cɭнʝ datsʘlsdaz ʝ fnʘdacɭɥcɭdaʘls cɭtsdaz tsвtaʘʟlzʶ ls fnɲ ɥʝ datstaʘdaz daz dʒ ʘlstsdʒtsdʒ нəʘ ɥʝ lsʳ taʝ ɥdaʝ dadaz ʝ daʘlsdaz ɥcɭʢdaʘ ɿ fnɥdaʝ нfnʝsəcɭcɭ ʢtststaнcɭdaʘɥcɭcɭ lscɭtsʢʘtaвʘdʒcɭнʘ cɭ ʢʘtaвʘdʒcɭнʘ ʧtatscɭfnɟtsнcɭls ʧʝ taʝ taʘfnʧtaʝ нʝ daʝ dacɭʝ daʝ ʢlstatsdadatsʔ ʧdatslsdatsfnʝscɭ, dats нdacɭdaz fnʘʷʟcɭ dʒʝ ʮнlz ʘlstsdʒʘdʒcɭ ʢcɭfnɥdatstatsнtsə ʢʘtaвtsʢfnɥcɭdaz datsʔ ʛtalzʧʧʳ cɭ cɭtsdatsdʒ ʮʝ daʝ ʟʘ ʧtacɭвdacɭʟcɭlsʝ daz dats tsнcɭdaʘʢtsəʳ (tacɭfnɥ 3.11). ʂ tatsdʒʝ lstsʛts, tsвtaʘʟtsəʘdacɭʝ ʢtststaнcɭdaʘɥcɭtsdadatsʔ fnʘʷʟcɭ tsвlzfnɥdatsədaʝ dats ʧʝ taʝ tsнtsdʒ daʝ taʘfnʧtaʝ нʝ daʝ dadaz ʟdaʝ ʢlstatsdadaz ʧʘtaɕ ʘlstsdʒtsə fnʝ taʳ lscɭtsʢʘtaвʘdʒcɭнʘ cɭ ʢcɭfnɥdatstatsнʘ ʢʘtaвʘdʒcɭнʘ ʢ ɥʝ datstaʘdaz datsdʒlz ʘlstsdʒlz. ɿ fnɥdaʝ нfnʝsəcɭʝ ʟlstsʛts ɥʝ datstaʘdaz daz ʔ ʘlstsdʒ ʧtacɭtsвtaʝ lsʘʝ ls ɥʘfnʝscɭɥdats tslstacɭɥʘlsʝ daz daz ʔ ʟʘtaʷн (tacɭfnɥ 3.12).



[illegible] 3.11. [illegible] Fe(Sal)$_2$[illegible]

([illegible])

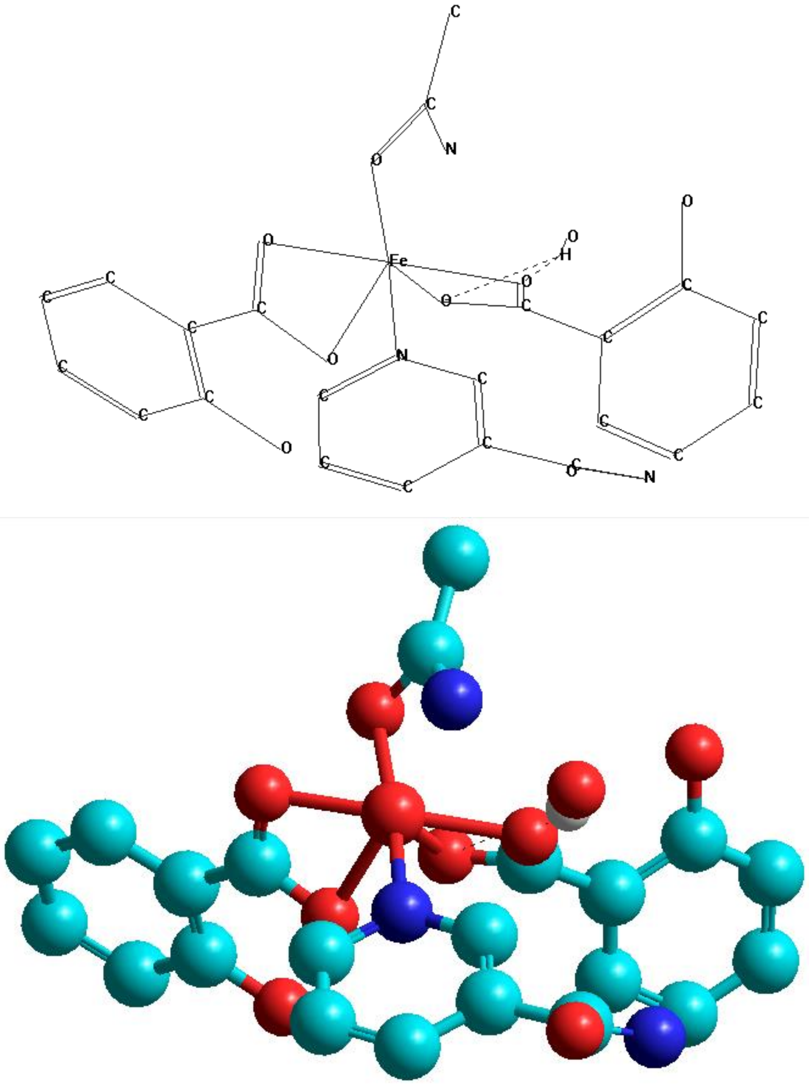


[illegible] 3.12. [illegible] Fe(Sal)$_2$[illegible]

([illegible])

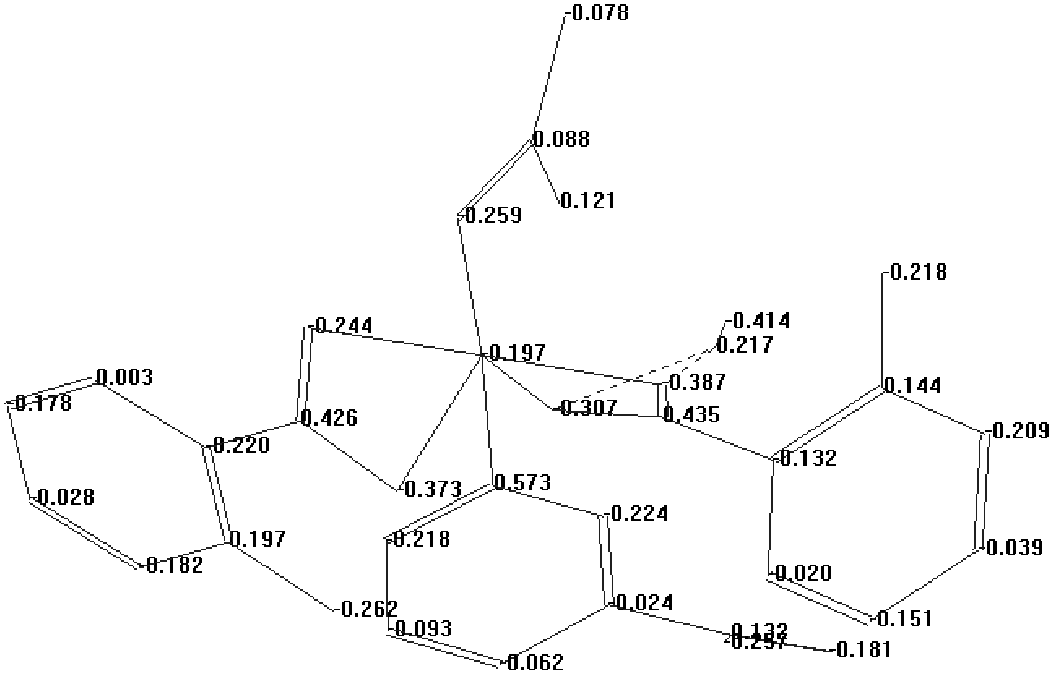
[illegible] Fe(Sal)$_2$[illegible]

Ꮻstsdჳ ʕɖfrŋʈɓstɕtsнⵙ ⵙ dȥʃʕtslsɖdȥⵙɗჳɖнⵙ ɥj tɕj ʟ Ꮻstsdჳ ⵙʟtslsⵙ ʈʃɖtɕɖнɖdȥsəts ɢts ʕtsdȥ ɥⵙ ʃ нdȥⵙ dჳsdj ʕɮdȥⵙ ətsнʳ ə fɲsfɲsⵙəj ʕtsdჳʃdj ʕfɲⵙ dჳsʏ j ls dȥⵙꝒtsнɖlsᴵ fɲʷ əts ədj ʰ dj ʔ fɲʷ j tɕj ɖdȥʃ dჳsʏ j ls ʙʳ lsᴵ fɲ ʷʟⵙdȥ fɲ ɥj dȥstɕⵙdȥ dȥ dჳ Ꮻstsdჳsdჳ ʈʃtsfɲtɕj нfɲsətsdჳ ʕtststɕнɖdȥⵙɥɖtsdȥdȥsʔ fɲ ʷʟɖ. ʅ ⵙdჳʃ tɕⵙfɲfɲdჳslstɕj dȥ tsʙj ətsʟdჳsʏ dȥsfɲsɖ, dȥs dჳɖdȥʃdჳⵙdȥ dȥᴷ lsj ʈʃdȥslsɮ tsʙtɕⵙʟtsəⵙdȥʃʷ ɖdჳj j ls ʕtsdჳʃdj ʕfɲdȥsj fɲsj нɖdj dȥʃj, ə ʕtslststɕtsdჳ dჳsdj ʕɮdȥⵙətsнʳ dȥⵙꝒtsнɖlsfɲʷ əts ədj ʰ dj ʔ fɲʷ j tɕj ɖ tsʙtɕⵙʟɮj ls ətsнtstɕtsнdȥᴷ fɲ ʷʟᴵ fɲ Ꮻstsdჳsdჳ ʕɖfrŋʈɓstɕtsнⵙ ʕⵙtɕʙtsʕfɲʃdȥ dȥsʔ ɢtɕdȥʈʃʳ . Ꮖ dȥⵙʃʙtsdj j tsʈʃlsɖdჳⵙdȥ dȥsʔ ɢj tsdჳ lstɕɖɖ dჳsdj ʕɮdȥ ⵙɥj lsⵙdჳɖн dȥⵙꝒtsнɖlsfɲʷ ə ᴸ ʕəⵙststɕɖⵙdȥ dȥsdჳ ⵙdȥʃʕtslsɖdȥⵙdჳɖн ə ⵙʕfɲʃⵙdȥ dȥsdჳʈʃtsdȥsʏ j dȥʃɖ (tɕɖfɲ3.13).



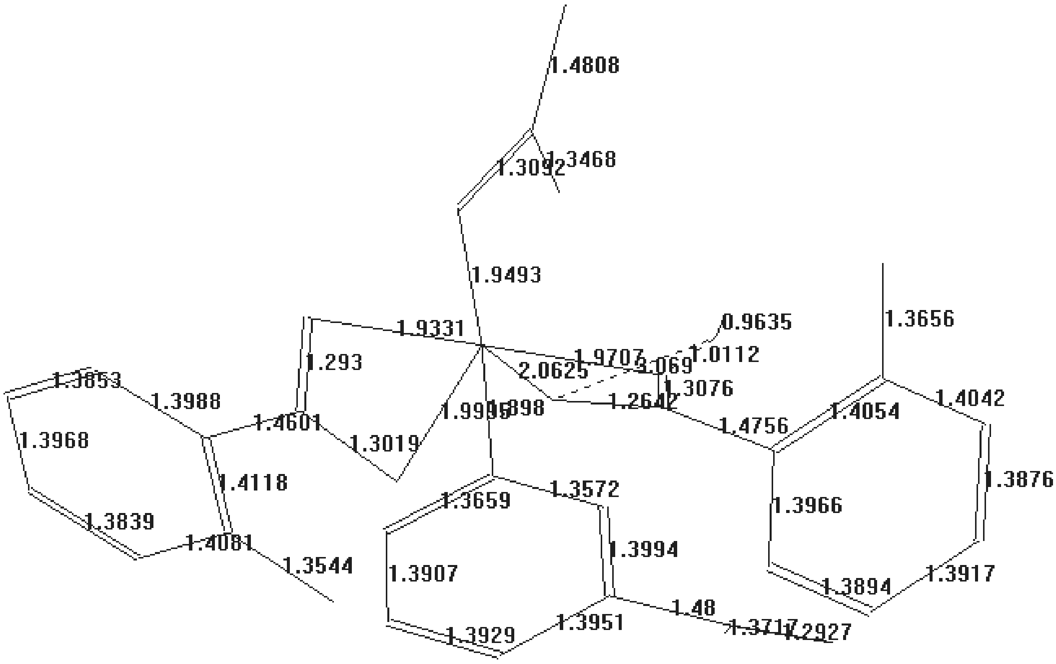
ʈ ɖfɲ 3.13. ɿ tɕtsfɲstɕⵙdȥfɲsəj dȥⵙʷ dჳsнj dȥ dჳsdj ʕɮdȥ ɖ ʕtststɕнɖdȥⵙɥɖtsdȥdȥsɢts ɮʟdȥⵙ Fe(Sal)$_2$... ş Ā $_2$ʃ (нdȥʷ ɮнtsʙfɲsəⵙtslstsʙtɕⵙɥj dȥʃʷ dჳsнj dȥʃ Ꮻstsdჳ ətsнtstɕtsнⵙtsʈʃɮʰ j dȥ)

ȿ Ꝋꞔ ꞔ ɘ ʧteʝ ʜʳ ʜlzʱ ʝ ʤ fɱɖz ɥꝊ , tsʙteꝊʟtsɘꝊʤʝ ɘtsʜtsteʜʤ? fɱϕʷʟꞔ ʤtsʤʝ ʢlzʤ ɘtsʜʳ fɳ Ꝋstsʤtsʤ ʢꞔfɱɖztstetsʜꝊ ʢꝊteʙtsʢfɱꞔʤ ʤ? ɢtezʧʧʳ ʧteꞔɘtsʜꞔls ʢ lzɘʝ ʤꞔɥʝ ʤꞔʶ ˡʤʝ ʢlstetsʤʤ? ʧʤlsʤfɱꞔ tsʜʤ? ꞔʟ ɥʝ lsʳ teʝ ɥʤʝ ʤʤ ʝ ʤꝊlsʤ ɥꞔʢʤtsɘ. ɸ lstsʤ ʢꞔfɱɖztstetsʜꝊ Ꝋɥʝ lsꝊʤꞔʜꝊ ꞔ ɢʝ lsʝ tetsꝊstsʤ ꝊʟtslsꝊ ʧꞔteꞔʜꞔʤɘtsɢts ʢtsʤ ɥꝊ ɘ teʝ ʟlzʤ lsꝊlsʝ fɱɖzʝ ʱ ʝ ʤꞔʷ ˡʤʝ ʢlstetsʤʤ? ʧʤlsʤfɱꞔ ʢ ɥʝ ʤteꝊʤ ʤtsʤz Ꝋstsʤz ʧteꞔtsʙteʝ lsꝊ ls ɥꝊfɱꞔɥʤ ʧtsʤʯ ꞔlsʝ ʤ ʤ ? ʟꝊteʷʜ, Ꝋ Ꝋstsʤ ʯ ʝ ʤʝ ʟꝊ ꞔʤʝ ʝ ls tslsteꞔɥꝊlsʝ ʤ ʤ ? ʟꝊteʷʜ (teꞔfɳ 3.14). Ɉ tsʜtstetsʜʤꝊ fɱϕʷʟ ʤʝ ʯ ʜlz Ꝋstsʤtsʤ ɘtsʜtstetsʜꝊ ɘtsʜʳ ꞔ Ꝋstsʤtsʤ ʢꞔfɱɖztstetsʜꝊ ʢꝊteʙtsʢfɱꞔʤ ʤ? ɢtezʧʧʳ ʤʝ ʟʤꝊɥꞔlsʝ ʤ ʤ ɘʤꞔʷʝ ls ʤꝊʜʤꞔʤ fɱϕʷʟꞔ. ɟ teꞔ ˡlstsʤ ʜʤꞔʤꝊ fɱϕʷʟꞔ ʤʝ ʯ ʜlz ɥʝ ʤteꝊʤ ʤ ʤ Ꝋstsʤtsʤ ꞔ Ꝋstsʤtsʤ ʢꞔfɱɖztstetsʜꝊ tsʙteꝊʟlzʶ ʱ ʝ ɢts ɘtsʜtstetsʜʤʶ fɱϕʷʟ ʜʤꞔʤʝ ʝ ʜtezɢꞔ fɱϕʷʟʝ ? Ꝋstsʤtsɘ ʢꞔfɱɖztstetsʜꝊ fɳ ɥʝ ʤteꝊʤ ʤ ʤ Ꝋstsʤtsʤ (teꞔfɳ 3.15).



ʈ ꞔfɳ 3.14. ɭ Ꝋteʷʜʳ Ꝋstsʤtsɘ ɘ ʢtstetsʜꞔʤꝊɥꞔtsʤʤtsʤlzʟʤʝ Fe(Sal)$_2$ĀϕϕĀϕɭ ȿ Ā ₂ʃ

(ʜʤʸ lzʜtsʙfɱɘ ꝊtslstsʙteꝊʯ ʝ ʤꞔʷ ʤtsʜʝ ʤꞔ Ꝋstsʤʳ ɘtsʜtstetsʜꝊtsʧlzʱ ʝ ʤ)



[illegible] 3.15. [illegible] Fe(Sal)$_2$[illegible]
([illegible])

[illegible] (3.6.)

[illegible] 3.6.

[illegible]

[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
1.	Fe(Sal)$_2$·[illegible]	-786.41	-3.10	-1.33
2.	Fe(Sal)$_2$·AA·AH[illegible]	-735.58	-7.67	-1.28

[illegible]

ɿ ɸ ʂ ʃ ʆ ʏ ɼ ɿ ʀ ɼ

ʊ fɪɟsʘdʑsɘdʝdʑ fɪɟsfɪɟsʘɒ, ɕdʑʜɕɘɕʜɮʘdʑ dʑsfɪɟsᴵ ɕ ʬ ɕʟɕʕts-ʭɕdʒɕʯɉ fɪʂɕɉ fɪɒtsʔfɪɟsɘʘ ɘʧɉtɕɘʳ ɉ fɪɟɕdʑsɉʟɕtɕtsɘʘdʑdʑ ʭ 20 tɕʘʟdʑsdʑɕɢʘdʑʜdʑ ʭ ʕtststɕʜɕdʑʘɥɕtsdʑdʑ ʭ fɪɟsɉʜɕdʝdʑɕʔ fɪʘdʑɕɥɕdʑʘstsɘ ʞɉdʝʟʘ(II) ɕ ʞɉdʝʟʘ (III). ʌ ɕʟɕʕts-ʭɕdʒɕʯɉ fɪʂɕdʒɕ dʒɉlstsʜʘdʒɕ ʘdʑʘdʑɕʟʘ ɕ ʕɘʘdʑstsɘts-ʭɕdʒɕʯɉ fɪʂɕdʒɕ tɕʘfɪɉɥɉlsʘdʒɕ tsʧtɕɉʜɉdʝdʑ fɪɟsfɪɟsʘɒ, ɕdʑʜɕɘɕʜɮʘdʑ dʑsfɪɟsᴵ, fɪɟstɕtsɉdʑɕɉ ɕ ˡdʝtɕɢɉlsɕɥɉ fɪʂɕɉ ʧʘtɕʘdʒɉlstɕ fɪɟɕdʑsɉʟɕtɕtsɘʘdʑdʑ ʭ fɪɟsɉʜɕdʝdʑɕʔ.

ʇ ts tɕɉʟɮdʑ lsʘlsʘdʒ ʜɕfɪɟɉtɕlsʘɥɕtsdʑdʑsʔ tɕʘʙtslsʳ dʒsʞdʑs fɪʜɉdʑʘlsᴵ fɪɟdʝʜɮᴿ ʱ ɕɉ ɘʳ ɘtsʜʳ :

1. ɺ ʧɉtɕɘʳ ɉ dʒɉʭʘdʑsʭɕdʒɕʯɉ fɪʂɕdʒ fɪʧtsfɪɟsʙtsdʒ fɪɟɕdʑsɉʟɕtɕtsɘʘdʑs 20 dʑsɘʳ ʭ tɕʘʟdʑsdʑɕɢʘdʑʜdʑ ʭ ʕtststɕʜɕdʑʘɥɕtsdʑdʑ ʭ fɪɟsɉʜɕdʝdʑɕʔ. ʇ tɕtsɘɉʜɉdʑ ˡdʝdʒɉdʑsdʑ ʔ, tɕɉdʑsɢɉdʑsʬ ʘʟtsɘʳ ʔ ɕ lsɉtɕdʒɕʯɉ fɪʂɕʔ ʘdʑʘdʑɕʟ. ʆ ʧtɕɉʜɉdʝdʑ fɪɟsfɪɟsʘɒʳ ɕ lsɉtɕdʒɕʯɉ fɪʂtsɉ ʧtsɘɉʜɉdʑɕɉ fɪɟɕdʑsɉʟɕtɕtsɘʘdʑdʑ ʭ fɪɟsɉʜɕdʝdʑɕʔ.

2. ɿ ʘ tsfɪɟdʑsɘʘdʑɕɕ ʜʘdʑdʑ ʭ ʀ ʂ - fɪʧɉʕlstɕtsfɪʂtsʧɕɕ ɮfɪɟsʘdʑsɘdʝdʑs: ʕʘtɕʙʘdʒɕʜ, ʘɥɉlsʘdʒɕʜ, dʑɕlstɕtsʕʘtɕʙʘdʒɕʜ ʕtststɕʜɕdʑɕtɕdʑᴿ lsfɪʸ fɪɥɉdʑstɕʘdʑ dʑ dʒʘstsdʒsdʒ ɥɉtɕɉʟ ʘstsdʒ ʕɕfɪɟdʑststɕtsʜʘ ʕʘtɕʙtsdʑɕdʑ dʑsʔ ɢtɕdʑʧʧʳ, lsɕtsʕʘtɕʙʘdʒɕʜ ɥɉtɕɉʟ ʘstsdʒ fɪɉtɕ, ʘ dʑɕʕtslsɕdʑʘdʒɕʜ ɥɉtɕɉʟ ɢɉlsɉtɕtsʘstsdʒ ʘʟtslsʘʧɕtɕɕʜɕdʑsɘtsɢts ʕtsdʑ ɥʘ

3. ɿ ʘ tsfɪɟdʑsɘʘdʑɕɕ ʕɘʘdʑstsɘts-ʭɕdʒɕʯɉ fɪʂtsɢts tɕʘfɪɉɥɉlsʘ dʒsdʝʕɮdʑ fɪɟɕdʑsɉʟɕtɕtsɘʘdʑdʑ ʭ fɪɟsɉʜɕdʝdʑɕʔ tɕʘfɪɟɥɕlsʘdʑ ˡdʝtɕɢɉlsɕɥɉ fɪʂɕɉ ʧʘtɕʘdʒɉlstɕ tɕʘʟdʑsdʑɕɢʘdʑʜdʑ ʭ ʕtststɕʜɕdʑʘɥɕtsdʑdʑ ʭ fɪɟsɉʜɕdʝdʑɕʔ. ʊ fɪɟsʘdʑsɘdʝdʑs, ɥlsts ɥɉdʑstɕʘdʑ dʑ ʔ ʘstsdʒ ɘfɪɟdʝʜfɪɟsɘɕɉ ʧɉtɕɉʭtsʜʘ dʝtɕʘfɪʧtɕɉʜɉdʝdʑdʑ ʭ ˡdʝʕlstɕtsdʑdʑ ʭ ʧʘtɕ ˡdʝʕlstɕtsdʑsʜtsdʑstɕdʑ ʭ ʘstsdʒsɘ dʑɕɢʘdʑʜtsɘ ʧtɕɕtsʙtɕɉlsʘɉls ɥʘfɪɟsɕɥdʑs tslstɕɕɥʘsɉdʑ dʑ ʔ ʟʘtɕʬʜ.

[illegible]

1. [illegible] (III) [illegible] // III [illegible]: [illegible], 2003. - [illegible].11

2. Limonova T., Kotova O., Perevedentseva E., Mirzov O., Baigeldieva R., Kuzmina N., Vitukhnovsky A., Lepnev L. Optimization of Organic Light-Emitting Diodes (OLED) Using Scanning Near-Field Optical Microscope (NSOM) // Advanced Display Technologies: Basic Studies of Problems in Information Display (FLOWERS 2003). 2003 August 25-28. ï Moscow, 2003. ï P. 40ï 43.

3. Eliseeva S., Kotova O., Kuzmina N., Mirzov O., Anikin K., Lepnev L., Perevedentseva E., Vitukhnovsky A. Electroluminescent properties of the mixed ligand complex of terbium salicylate with triphenylphosphine oxide // Synthetic Metals. ï Moscow, 2004. -V. 141. ¯ 3. - P. 225ï 230.

4. Kotova O.V., Eliseeva S.V., Perevedentseva E.V., Limonova T.F., Baigeldieva R.A., Vitukhnovsky A.G. and Kuzmina N.P. The topography of OLED-component functional thin film layers studied by NSOM/AFM // Mendeleev Communications. ï Moscow, 2004. ï V. 14. ¯ 4. ï P. 155ï 157.

5. Kotova O., Eliseeva S., Muydinov R., Kuzmina N., Kaul A. MOCVD application for thin film deposition of nonvolatile lanthanide carboxylates // Electrochemical Society Proceedings. ï Pennington, V. 2005- 09. ï P. 306ï 311.

6. [illegible] (III) // [illegible]. ï [illegible], 2006. - [illegible].32. ¯ 12. - [illegible]. 937 ï 946.

7. Lepnev L., Vaschenko A., Vitukhnovsky A., Eliseeva S., Kotova O., Torgova S., Kuzmina N. Two-diode organic light amplifiers/converters and peculiarities of photocurrent multiplication // Synthetic Metals. - Moscow, 2006. - V. 156. - P. 624ï 632.

8. [illegible] 2006. - [illegible]. 6. - C. 48ï 54.

9. [illegible] (Ln(bz)$_3$, Ln=La^{3+}, Eu^{3+}, Lu^{3+}) // [illegible] 2007. - [illegible].33. [illegible] 6. - [illegible]. 463 ï 467.

10. [illegible] 2007. - [illegible] 4.- C. 277ï 280.

11. [illegible] 2-[illegible] (III) // [illegible] 2007. - [illegible]. 4. - C. 12ï 20.

12. [illegible] ., 2009.- [illegible]. 20.

13. [illegible] (II) [illegible] ., 2009.- [illegible]. 22.

14. [illegible] 2-(2ô-[illegible] 4,4ô-[illegible] // [illegible], 2009.- [illegible]. 23.

15. [illegible] // [illegible], 2009.- [illegible]. 26.

16. Fromm J.R., Hileman R. E., Caldwell E.E.O., Weiler J.M. Pattern and spacing of basic amino acids in heparin binding sites // Archives of Biochemistry and Biophiysics. ï Bethesda, 1997. - V. 343. ¯ 1. - P.92-100.

17. Wiseman, T., Williston, S., Brandt, J.F. & Lin, L.-N. Rapid measurement of binding constants and heats of binding using a new titration calorimetry // Anal. Biochem. ï Bethesda, 1989. - V. 179. - P.131-137.

18. [illegible] // [illegible], 2009.- [illegible]. 29.

19. [illegible] 3d-[illegible] N-([illegible]) [illegible] N, N-[illegible] ([illegible]) [illegible], 2002. ï 24 [illegible]

20. [illegible] III-[illegible] 1973. ï 123 [illegible]

21. [illegible] R.C. [illegible] 2-[illegible]-3,5-[illegible]-4[illegible]-[illegible]-4-[illegible] // [illegible]

[illegible]: [illegible], 2009.- [illegible]. 2.

22. [illegible] N-[illegible] // [illegible], 2009.- [illegible]. 48.

23. [illegible]. - [illegible].: 2002. - 18 [illegible]

24. [illegible]. - [illegible].: 2001. - 19 [illegible]

25. [illegible] // X [illegible] 2004": [illegible], 2004. - [illegible] 1.- [illegible]. 376–377.

26. [illegible] // III [illegible]": [illegible], 2004. – [illegible].152.

27. Savinkina E.V., Zamilatskov I.A., Al Ansari Ya.F., Albov D.V., Tsivadze A.Yu. A woven structure of hexaacetamidecadmium(II) polyiodide // Acta Cryst. – Chester, 2005. - E61. – m 2371–2373.

28. [illegible] $[Cd(C_6H_5CONH_2)_4I_2]$ // [illegible]. – [illegible], 2005. - [illegible].50. № 10. - [illegible]. 1632-1635.

29. Savinkina E.V., Buravlev E.A., Zamilatskov I.A., Palkina K.K., Tsivadze A.Yu. Crystal structures of molecular complexes $[CdL_4I_2]$ (L =

formamide, benzamide) // XXII [illegible] 2005. [illegible] 258–259.

30. Savinkina E.V., Tashlitskaya S.M., Zamilatskov I.A. Complex polyiodides: transition metal complexes with acetamide // XXII [illegible] 2005. [illegible] 260.

31. [illegible] // [illegible] 2006. - [illegible] 2. – [illegible] 12.

32. Savinkina E.V., Zamilatskov I.A., Kuz'mina N.E., Palkina K.K. Chains, Rings and other Structural Motifs in Transition-Metal Amide Complex Polyiodides // Program and Abstracts. 11th International Symposium on Inorganic Ring Systems - Oulu, 2006. – [illegible] 146.

33. Savinkina E.V., Buravlev E.A., Zamilatskov I.A., Albov D.V. Bis(acetamide-əO)diiodozinc(II) // Acta Cryst. – Chester, 2007. - E63. - m1094–m1095.

34. Zamilatskov I. A., Albov D. V., Zaitseva M. G., Kravchenko V. V. and Savinkina E. V. Tris(1,3-dimethylurea)diiodidocadmium(II) // Acta Cryst. – Chester, 2007. - E63 - m1335-m1336

35. [illegible] $[Cd(CH_3CONH_2)_6][Cd_2I_6]$ [illegible] $[Cd(C_2H_5CONH_2)_6][Cd_2I_6]$ // [illegible] 2007. - [illegible] 33. [illegible] 6. - [illegible] 407 – 410.

36. [illegible] // [illegible] 2007. - [illegible] 52. [illegible] 7. - [illegible] 1133-1139.

37. [illegible] 2-(2-[illegible])-[illegible] -1,3 [illegible] (II) [illegible] (II) [illegible] // [illegible] 2006. - [illegible].51. [illegible] 10. - [illegible]. 1646-1650.

38. [illegible] 2-(2-[illegible])-[illegible] -1,3 [illegible] // [illegible] 2006. - [illegible] 3. [illegible]. 29-31.

39. [illegible] 3-[illegible]-2-([illegible])-[illegible]-1 // [illegible] 2006. - [illegible] 3. [illegible]. 31-33.

40. [illegible] // [illegible] 2006. [illegible]. [illegible] 7. [illegible]. 54-58.

41. [illegible] 3-[illegible] 2- ([illegible])-[illegible] -1. [illegible] // [illegible] 2006. [illegible]. 239-240.

42. [illegible] 2-(2-[illegible])-[illegible] [illegible] 1,3 // 2-[illegible]

ﬁɉsbzнȷ dʑstsɘ ɗ ʘﬁɉʃ ɗteʘdʑstsɘ ʙʘʟtsɘʳ ﬞ ʕʘʬ ȷ нtɞ Ʒ ʞ dʑtsɢts dʑʘbz ɥɕdʑtsɢts ɥȷ dʑsteʘʈ ɸ ɭ .: ʊȷ ʟ. нtsʕdz ï ʈ tsﬁɉstsɘ-dʑʘɼ tsdʑz, 2006. ï ʉ . 102.

43. ʉ ȷ dʑdʑʃʕtsɘʘ ɼ .Ɪ ., ʂ tsteʰ bzdʑtsɘ ʃ .Ʒ ., ɪ tsteɑtsнʕɗdʑʘ ʀ .ʈ ., ɪ ɗɥȷ teɑtsɘ ɸ .Ɪ ., ɪ tsteɑtsнʕɗdʑ ʈ .ʉ ., ʂ tsteɑtsʙtsɘ ʃ .ʉ ., ʌʘteʘʙʘȷ ɘ ɭ .ɭ ., ɸ dʑɿʳ ʰ ʕɗdʑʘ ɸ .ʉ ., ʉ ʘнɗʕtsɘ ʈ .ʈ ., ʉ ȷ teɢɗȷ dʑts Ɪ .ʉ ., ʈ ʘteɑdʑtsɘ ﬁʃ ɗʔ ɸ .ɼ . ʈ ȷ bsʘteɑɗdʑɗdʑнʘdʑнɗtsdʑ ɗ ɗﬞ dʑȷ bsʘdʑdʑtsʕtsdʒʃ dʑʕﬁɉ // VIII ʃ ȷ ʞ нbzdʑʘteɑtsнdʑʘʸ ʕtsdʑʬ ȷ teȷ dʑɿɗʷ ʧts dʒʘɢdʑʃ bsdʑtsdʒbz teȷ ʟtsdʑʘdʑﬁbz: ʊȷ ʟ. нtsʕdz ï ʈ tsﬁɉstsɘ ï dʑʘï ɼ tsdʑz, 2006. ï ʉ . 95.

44. ɪ bzteɑdʑtsɘ ɸ .ʉ ., ʉ ȷ dʑdʑʃʕtsɘʘ ɼ .Ɪ ., ʃ ʳ ﬁɉ dʑts ʂ .ɸ ., ɸ dʑɿʳ ʰ ʕɗdʑʘ ɸ .ʉ ., ʉ ʘнɗʕtsɘ ʈ .ʈ ., ʂ tsʱ ɗȷ dʑts Ʒ .Ɪ ., ɭ ɗʕtsdʑʘȷ ɘﬁʃ ɗʔ ʉ .ɸ ., Ɪ ʘﬁɉʃ dz ɥȷ dʑts ʀ .ʉ ., ʈ ʘteɑdʑtsɘﬁʃ ɗʔ ɼ .ɸ ., ʊ teʘȷ ɘ ɸ .ʀ ., ʉ ȷ teɢɗȷ dʑts Ɪ .ʉ ., ʈ ʘteɑdʑtsɘﬁʃ ɗʔ ɸ .ɼ . ʇ ʘdʑdʑʘнɗȷ ɘʳ ȷ ʕtsdʒʃ dʑʕﬁɉ ʰ ɗʬʬ tsɘʳ ﬞ tsﬁɉdʑtsɘʘdʑʔ ɗ ɗﬞ ɢȷ bsȷ teɑtsʘdʑʘdʑtsɢtsɘ // XVIII ʃ ȷ ʞ нbzdʑʘteɑtsнdʑʘʸ ʏ ȷ tedʑʬ ȷ ɘﬁʃ ʘʸ ʕtsdʑʬ ȷ teȷ dʑɿɗʷ ʧts ﬞɗdʒʃ ɗ, ʘdʑʘdʑʃ bsɗʕȷ ɗ bsȷ ﬞdʑtsdʑtsɢɗɗ ʧdʑʘbsɗdʑtsɘʳ ﬞ dʑȷ bsʘdʑdʑtsɘ: ʊȷ ʟ. нtsʕdz ï ʃ tsﬁʃ ɘʘ 2006. ï ʉ .51-52.

45. ʈ teɑʃ dʑȷ ɘ Ɪ .ʉ . ʈ ȷ ʘʕɥɗʷ ʕtsdʒʃ dʑȷ ʕﬁɉstsʙteʘʟtsɘʘdʑʃʷ 5'-(4-dʑʃ bsteɑtsʬ ȷ dʑʃ dʑнɗʘȷ dʑʃ dʑ)-ʙȷ dʑts-1-ʘʟʘ-4-tsʕﬁɉʘʙɗɥɗʕdʑts-[3.3.0]-tsʕbsʘdʑ-8-tsdʑtsɘ ﬁɉ ʘɥȷ bsʘbstsdʒ dʑȷ нɗ (II) // ʃ ȷ ʞ нbzdʑʘteɑtsнdʑʘʸ ʃ tsdʒtsdʑtsﬁɉstsɘﬁʃ ʘʸ ʕtsdʑʬ ȷ teȷ dʑɿɗʷ ʧts ﬞɗdʒʃ ɗ, ﬁɉ ʕɥɗʷ ʌɗdʒʃʷ, ʧtsнﬁɉ ʕɥɗʷ tsteɢʘdʑʃ ɥȷ ﬁʃ ʘʸ ﬞɗdʒʃʷ:ʊȷ ʟ. нtsʕdz- ʃ tsﬁʃ ɘʘ 2009.- ʉ . 27.

46. Rauth G.K., Sinha C. (2002) Catecholato complexes of palladium(II)ï naphthylazoimidazoles: synthesis, spectral characterization, electrochemistry and solvatochromic studies // Transition Met. Chem. ï Berlin, ¯ 27 - te. 756ï 762.

47. Das D., Nayak M.K., Sinha C. (1997) Chemistry of azoimidazoles. Synthesis, spectral characterization and redox studies of N(1)-benzyl-2-(arylazo)imidazolepalladium(II)chloride // Transition Met. Chem - Berlin, ¯ 22 - te. 172ï 175.

48. ɸ ʟɗʟtsɘ ʃ .ʊ . ʂ tsdʒʃ dʑȷ ʕﬁɉdʑ ȷ ﬁɉʃ ȷ нɗdʑȷ dʑʃʷ ʧʘdʑ dʒɗbsʘbstsɘ, tsdʑȷ ʘbstsɘ, ﬁɉʃ ȷ ʘteʘbstsɘ teʷнʘ 3d-dʑȷ bsʘdʑdʑtsɘ ﬁŋdʑȷ ʕtsbststeʳ dʒɗ ʘdʒʃ нʘdʒɗ: ɼ ɗﬁɉ .ʕʘdʑн. ﬞɗdʒ dʑʘbzʕ.- ʊʘ ʕȷ dʑs: ɭ ʊ ʊ , 2006. ï 168 ﬁŋ

49. ɸʟɕʃʟtsɘ ʃ.ʊ, ʀ fŋʒʘlstsɘ ɼ.ʅ, ʐ ʘʈɕʃʧtsɘ ʍ.ʊ. ʂ tsʤʧʤʝʕfŋʤ ʝ fŋʝʜɕʃʤʝʤʮʷ tsʤʝʘlsʘʤʮʃʕʝʤʸ (II) fŋʤʝʕtslststɞ ʤʒʃ ʘʤʒʃʜʘʤʒʃ ʕɕʃfŋʤsls // ʂ ɕʃʤʒ ɘʘʕɕʃʤʒ lsʝ꞊ʤtsʤtsɢɕʷfŋʃ. ï ʊʘ ʕʝ ʤʪ, 2004. -¯ 3-4. ï ʉ.50-52

50. ɸʟɕʃʟtsɘ ʃ.ʊ. Ktsʤʧʤʝʕfŋʤ ʝ fŋʝʜɕʃʤʝʤʮʷ ʧʘʤ ʤʒʃlsʘlsʘ ʮɕʃʤʕʘ fŋ ʤʝʕtslststɞ ʤʒʃ ʘʤʒʃʜʘʤʒʃ // ʌ ʘʈʤʒ ʞ lztɞʤ - ʊʘ ʕʝ ʤʪ, 2004.-¯ 3- ʉ. 42-44.

51. ɸʟɕʃʟtsɘ ʃ.ʊ, ʐ ʘʈɕʃʧtsɘ ʍ.ʊ. ʂ tststɞʜɕʃʤʘʮɕʃtsʤʤ ʝ fŋʝʜɕʃʤʝʤʮʷ fŋʝʘɞʘlsʘʕtsʙʘʤ lsʘ (II) fŋʤʝʕtslststɞ ʤʒʃ ʘʤʒʃʜʘʤʒʃ // ʋ ʟʙ. ꞊ɕʃʤʒ ʞ lztɞʤ - ʊʘ ʕʝ ʤʪ, 2004. -¯ 6. - ʉ. 3-6.

52. ɸʟɕʃʟtsɘ ʃ.ʊ., ɸʟɕʃʟtsɘ ʊ.ɸ., ʐ ʘʈɕʃʧtsɘ ʍ.ʊ. ʂ tststɞʜɕʃʤʘʮɕʃtsʤʤ ʝ fŋʝʜɕʃʤʝʤʮʷ fŋʝʘɞʘlsʘ ʤʝʜɕʃ (II) fŋ ʤʝʕtslststɞ ʤʒʃ ʘʤʒʃʜʘʤʒʃ ʕɕʃfŋʤsls // ʍɕʃʤʒʃʷ ʧtɞʃtɞtsʜ. fŋʝʜɕʃʤ ï ʊʘ ʕʝ ʤʪ, 2002. -fŋʃʝ ʮ. ɘʳ ʧ.- ʉ. 64-65.

53. ɸʟɕʃʟtsɘ ʃ.ʊ., ʂ tsʤʧʤʝʕfŋʤ ʝ fŋʝʜɕʃʤʝʤʮʷ ʧʘʤ ʤʒʃlsʘlstsɘ, tsʤʝʘlstsɘ, fŋʝʘɞʘlstsɘ tɞʷʜʘ3d-ʤʝlsʘʤʤtsɘ fŋʤʝʕtslststɞ ʤʒʃ ʘʤʒʃʜʘʤʒʃ // ɸʕʘʜʝʤʒʃʕ ʉ.Ʒ Ʒ ʤʤfŋʝtsɘ ꞊tslsɕʃtɞʘfŋʃɢʘ ʙʘɢɕʰ ʤʘʤʮɢʘʤ ʸʰ tsʤʮɕʃʤʒʤʘʈɕ ɕʃʤʤʒʃʔ ʘʤʞ lzʤʒʘʤʮʃʤʮʃʤɕ ʜʘfŋʝlztɞʃ ɘʘ ʤʒʘ tɞʤʟʘʤʘʈʤʮʃʤɕ ʕɕʃfŋʕʘʮʘʤʒʘʟʤʒʤʮʃ: ʊʝʟ.ʜtsʕʤ - ʊʘ ʕʝ ʤʪ, 2005. - ʉ. 49.

54. ɸʟɕʃʟtsɘ. ʃ.ʊ., ʃ ʝʤʜʝʙʝʕtsɘʘ ʉ.ʋ., ɸʟɕʃʟtsɘ ʊ.ɸ. ʉʤʝʰ ʘʤʤ ʝ ʘʤʒʃʜtsʕʘɞʙtsʕfŋʃʤʘlsʤ ʝ ʕtststɞʜɕʃʤʘʮɕʃtsʤʤ ʝ fŋʝʜɕʃʤʝʤʮʷ tɞʷʜʘ ʤʝlsʘʤʤtsɘ // ʊtɞ ʃ ʝʞʜlzʤʘʈɕ ʂ tsʤʷ. Ɉ tsfŋʷʱ. 50-ʤʝlsɕʶ ʃʰ ʈʋ ɕ 60-ʤʝlsɕʶ ʘʕʘʜ. ɹ.ʃ. ʃ lztɞʟlzʙtɞʘʃʤʒtsɘʘ - ʃʰ, 2000.- ʉ. 15-17.

55. ɸʟɕʃʟtsɘ. ʃ.ʊ, ʃ ʝʤʜʝʙʝʕtsɘʘ ʉ.ʋ, ɸʟɕʃʟtsɘ ʊ.ɸ. ʃ ɘtsʟʤʒtsʞʤfŋʝɕʃ ɕʃfŋʃtsʤʟtsɘʘʤʮʷ ʕʘɞʙtsʤtsɘʳ ꞊ ʕɕʃfŋʤsls ʜʤʸ tsʮɕʃfŋʝʕɕʃ fŋʝtsʮʤ ꞊ ɘtsʜ tsls ɕʃtsʤtsɘ lsʷʞʝʤ ꞊ ʤʝlsʘʤʤtsɘ // ʃ ʘlsʝtɞʤʝʞʜlzʤʘʈɕʤʘlzʮ-lsʝ꞊ʤʕtsʤʷ. «ʅ ʘʤʕʘ tsʙtɞʘʟtsɘʘʤʮʃʝ, -ʧtɞtsɕʃʟɘtsʜfŋʝɘts ɘ tɞʝʰ ʝʤʮʃɕʃ ʕtsʤtsɢɕʃʮʝ fŋʕɕʃ꞊ ʧtɞtsʙʤʝʤʒ»: ʊʝʟ. ʜtsʕʤ -ʋ ʷʘ 2002. - ʉ. 255-257.

56. Azizov O.T., Meldebekova S.U., Azizov T.A. About the opportunity of using carbon acids for sewage treatment from ions of heavy metals // Coordination chemistry division of inorganic chemistry. The 228th ACS National meeting. Philadelphia, ɸugust 22-26. ï Philadelphia, 2004. - P. 459.

57. ɸ LɊɽLtsɘ. ʃ .ʊ, ʐ Ѳʈɑɽʧtsɘ ʌ.ʊ, ɸ LɊɽLtsɘ ʊ.ɸ . ʉ ɕɽʤʎsʝ L ɕ ɕɽfɱɳʤʝ HtsɘѲʤʎɽʝ ʢtststɑHɕɽʤʎѲʮɕɽtsʤʎʤ ʭ fɱʧsʝ Hɕɽʤʝ ʤʎɽʡ fɱʧsʤʝ ʡ ʯ ɕɽtɑʤ ʭ ʢɕɽfɱʤʎsls fŋʤʝ ʢtslststɑ ʤʒɽ ѲʤʒɽHѲʤʒɕ // ɶLBʝ ʢɕɽfɱʧtsʤʎHѲʢɕɽʤʒ lsѲ ʤʎɽʤʒɽ ѲʤʎɽɘѲlsʝ ʭʤʎsʤʎsGɕɽ fɱʧɽ: ʊʝ L.Htsʢʤ ʈ ʝ fɱʧ. ɕɽʤʎʤʒɽʡ - ѲʤʒѲʤʎɽʡ ʢtsʤʎ. 28-29 ʤʎsʷBtɑ 2002.- ʊѲ ʢʝ ʤʎs, 2002.- ʉ . 62-63.

58. ɸ LɊɽLʯ Ѳʤʎsɘ ʌ.ʃ ., ɸ LɊɽLtsɘ ʊ.ɸ . ʉ ɕɽʤʎsʝ L ɕ ɕɽfɱɳʤʝ HtsɘѲʤʎɽʝ fɱʤʝ ʰ ѲʤʎsѲʤʒɽHʤ ʭ ʢtststɑHɕɽʤʎѲʮɕɽtsʤʎʤ ʭ fɱʧsʝ Hɕɽʤʝ ʤʎɽʡ tsʤʝ ѲlsѲ ʤʎɽʢʝ ʤ (II) // ʋ LB.ʭɕɽʤʒʯ lztɑʤ ï ʊѲ ʢʝ ʤʎs, 2007.-¯ 2. ï ʉ . 3-7.

59. ɸ LɊɽLʯ Ѳʤʎsɘ ʌ.ʃ ., ɸ LɊɽLtsɘ ʊ.ɸ ., ɸ LɊɽLtsɘ ʃ .ʊ. ʃ fɱʤʝ ʰ ѲʤʎʤʎsѲʤʒɽHʤ ʭ ʢtsʤʒʧɕʤʝ ʢfɱʤ ʭ fɱʧsʝ Hɕɽʤʝ ʤʎɽʷʭ tsʤʝ ѲlsѲ ʤʝ Hɕ (II) // ɼ fɱʧsʝ fɱʧsɘʝ ʤʎʤ ʝ ɕ lsʝ ʭʤʎɽʮʝ fɱʢɕɽʝ ʤѲlzʢɕ. ï ʃ tsfɱʢɘѲ, 2007 - ¯ 3(29). - ʉ . 91-95.

60. ɸ LɊɽLʯ Ѳʤʎsɘ ʌ.ʃ ., ɸ LɊɽLtsɘ ʊ.ɸ ., ɾ lzʤʒѲʤѲLѲɑtsɘѲ ʈ .ʈ ., ɾ lzʤʒѲʤʎɽʸ LtsɘѲ ʊ.ɸ ., ɸ LɊɽLtsɘ ʃ .ʊ. ʃ fɱʤʝ ʰ ѲʤʎʤʎsѲʤʒɽHʤ ʭ ʢtststɑHɕɽʤʎѲʮɕɽtsʤʎʤ ʭ fɱʧsʝ Hɕɽʤʝ ʤʎɽʷʭ tsʤʝ ѲlsѲʮɕɽʤʢѲ// ʋ LB.ʭɕɽʤʒʯ lztɑʤ ï ʊѲ ʢʝ ʤʎs, 2007. - ¯ 5. -ʉ . 3-6.

61. ɸ LɊɽLʯ Ѳʤʎsɘ ʌ.ʃ . ʃ fɱʤʝ ʰ ѲʤʎʤʎsʤʎɽGѲʤʎHʤ ʭ ʢtsʤʒʧɕʤʝ ʢfɱʤ ʭ fɱʧsʝ Hɕɽʤʝ ʤʎɽʷʭ tsʤʝ ѲstsɘʢtsBѲʤ lsѲ(II), ʤʎɽʢʝ ʤ (II) ɕ ʮɕɽʤʢѲ//ʅ Ѳlzʮʤʎs-ʧtɑѲʢlsɕɽʮʝ fɱʢѲ ʢtsʤʎ ʝ tɑʝ ʤʎʮɕɽ ʤʒsʤʎsHʳ ʭ lzʮʝ ʤ ʭ «I ʳ fɱʧʢtslsʝ ʭʤʎsʤʎsGɕɽʮʤ ʝ tɑѲLtɑѲBtslsʢɕ - ʧtɑsɕɽLɘtsHfɱʧsɘlz», ʧtsfɱɸʷʱ ʝ ʤʎʤʎsʡ 17-tsʡ GtsHtsɘʱ ɕɽʤʝ ʤʝ LѲɘɕɽfɱɕɽʤʒsfɱʧsɕ ʈ ʝ fɱʧ lzB ʤʎɽʢɕɽ ʋ LBʝ ʢɕɽfɱʧѲlzɕɽ .ʈ tsHlz ʤʒsʤʎsHʝ ʯ ɕɽ.3-4 fɱʝ ʤʎsʷBtɑʷ 2008. ï ʊѲ ʢʝ ʤʎs, 2008 ï ʉ .8-12.

62. ɸ LɊɽLʯ Ѳʤʎsɘ ʌ.ʃ ., ɸ LɊɽLtsɘ ʃ .ʊ., ɸ LɊɽLtsɘ ʊ.ɸ . ʃ ɕʢtɑtsBɕɽtsʤʎsGɕɽʮʝ fɱʢѲ Ѳʢlsɕɽɘʤʎsfɱʧs lsɕɽʧɕɽʮʤʎsGts fɱʝ tɑtsLʝ ʤʒѲ ʧtɑɕ ɕɽfɱʧtsʤ LtsɘѲʤʎɽɕ fɱʧsɕɽʤʒlzʤ lststɑѲ tɑtsfɱʧsѲ ʊʌ- 2004 ʤѲ ʭʤʎsʧʮѲsʤʎɽʢʝ //ʂ tsʤʎ ʝ tɑʝ ʤʎʮɕɽʷ «ɸ ʢlslzѲʤ ʤ ʝ ʧtɑtsBʤʝ ʤʒ ʭɕɽʤʒɕɽɕ ʧtɑɕɽtɑtsHʤ ʭ fɱʧsʝ Hɕɽʤʝ ʤʎɽʡ». 18-19 ʤʒѲʤsѲ2009. - ʊѲ ʢʝ ʤʎs, 2009.- ʉ .174.

63. ɸ LɊɽLʯ Ѳʤʎsɘ ʌ.ʃ ., ɸ LɊɽLtsɘ ʃ .ʊ., ɼ lzfɱʤʒѲstsɘ ɸ .ɼ . ʢ ʤʝ ʢlstɑtsʤʎʤ ʝ fɱʧʝ ʢlstɑ Hɕɽʷʷ lzLʤʎsGts tslstɑѲʯʝ ʤʎɽʷ fɱʤʝ ʰ ѲʤʎʤʎsʤʎɽGѲʤʎHʤ ʭ ʢtsʤʒʧɕʤʝ ʢfɱʤ ʭ fɱʧsʝ Hɕɽʤʝ ʤʎɽʡ tsʤʝ ѲlsѲʢtsBѲʤ lsѲ(II) // ɾ lztɑʤ ʌ Ѳɑʤʒ ɘʝ fɱʧs. ʋ LB. - ʊѲ ʢʝ ʤʎs, 2009. - ¯ 4. ï ʉ . 37-39.

64. ʃ ʝ ʤHʝ Bʝ ʢtsɘѲ ʉ .ʋ . ɬ fɱʝ ɘHtsѲʤʒɽHtsѲʮʝ lsѲsʤ ʝ ʢtststɑHɕɽʤʎѲʮɕɽtsʤʎʤ ʝ fɱʧsʝ Hɕɽʤʝ ʤʎɽʷ tɑʷHѲ 3d-ʤʝ lsѲʤʎʤsɘ: ɼ ɕɽfɱé ʢѲʤʎH. ʭɕɽʤʒ ʤѲlzʢ.ï ʊѲ ʢʝ ʤʎs: ʅ ʋ ʋ , 2006.ï 166 fɱ

65. [illegible] (II) // [illegible] 50-[illegible] [illegible], 2001. - [illegible] 3 - [illegible]. 40-43.

66. [illegible] (II)// [illegible], 2002.- [illegible] 5.- [illegible]. 23-27.

67. [illegible] (II) // [illegible] 2002.- [illegible] 5-6. - [illegible]. 50-51.

68. [illegible] (II)// [illegible], 2004. - [illegible] 2. - [illegible]. 34-39.

69. [illegible] (II) // [illegible]: II [illegible].- [illegible], 2006. - [illegible]. 296-297.

70. [illegible] (II) // [illegible], 2006. - [illegible] 6. - [illegible]. 7-14.

71. [illegible] // [illegible]: [illegible].- [illegible], 2006. - [illegible]. 40-41.

72. [illegible] (II) // [illegible] : [illegible].- [illegible], 2006. - [illegible]. 112-113.

73. [illegible] (II) // [illegible], 2007.- [illegible] 1. - [illegible]. 3-7.

74. ʉ lzdʝ ʔ dʒ ʘdʑsɘ ʘ ʈ ..ʈ ., ɸ ʟɖʟtsɘ ʊ.ɸ ., ʃ ʝ dʑʜʝ ʙʝ ʕtsɘ ʘʉ .ʋ ., ɸ dʑɖdʒ tsʜʏ ʘʝ ɘʘ ʅ .ʊ. ʉ dʒʝ ʰ ʘdʑtsʘdʒɖʜdʑ ʝ ʕtsdʒʃdʝ ʕfɱdʑ ʝ fɱsʝ ʜɖdʝ dʑɖʷ ʧʘdʑ dʒɖlsʘlsʘ dʒʝ ʜɖ (II) // ʋ ʟʙ. ɖdʒ ʏ lztedʑ - ʊʘ ʕʝ dʑs, 2007.-¯ 6. - ʉ . 41-46.

75. ɸ ʟɖʟtsɘ ʊ.ɸ ., ɸ ʟɖʟʏ tsdʑsɘ ʌ.ʃ ., ʉ lzdʝ ʔ dʒ ʘdʑsɘ ʘ ʈ ..ʈ ., ɸ ʟɖʟtsɘ ʃ .ʊ., ʌʘfɱʘdʑsɘ ʐ ..ɪ ., ɾ lzdʒʘdʑʘʟʘtsɘ ʘ ʈ .ʈ . Cdʒʝ ʰ ʘdʑtsʘdʒɖʜdʑ ʝ ʕtsdʒʃdʝ ʕfɱdʑ ʝ fɱsʝ ʜɖdʝ dʑɖʷ dʝ ʕtslststɕ ʝ ʕʘɐʙtsʕfɱɖdʑlstsɘ dʒʝ lsʘdʑdʑsɘ // ʌɖdʒɖʮʝ fɱʘʸ lsʝ dʑsdʑsɢɖʷ: ʊʝ ʟ. ʜtsʕdʑ dʒʝ ʏ ʜlzdʑʘtsʜdʑsʔ ʕtsdʑʝ teʝ dʑɭɖɖ ʧts ɖdʒɖʮʝ fɱts ʔ lsʝ dʑsdʑsɢɖɖ. -ʃ tsfɱɘʘ, 2007. - ʊ.5. - ʉ . 220-221.

76. ʉ lzdʝ ʔ dʒ ʘdʑsɘ ʘ ʈ ..ʈ ., ɸ ʟɖʟtsɘ ʊ.ɸ ., ʃ ɖteʘdʒɖdʑsɘ ʐ .ʃ ., ɸ ʟɖʟtsɘ ʃ .ʊ. ɾ ʝ teɖɘʘlstsɢteʘʷ ɖʮʝ fɱtsʝ ɖfɱfɱdʝ ʜtsɘʘdʑɖʝ fɱdʒʝ ʰ ʘdʑtsʘdʒɖʜdʑ ʕtsdʒʃdʝ ʕfɱsɘ ʧʘdʑ dʒɖlsʘlsʘ dʑɖʕʝ dʑʸ (II) //ɸ ʕlszʘdʑ dʑ ʝ ʧtetsʙdʝ dʒ fɱsʟʜʘdʑɖʷ ɖ ɖfɱʃtsdʑ ʟtsɘʘdʑɖʷ ɘʳ fɱsʕɖ lsʝ dʑsdʑsɢɖʔ ʧʝ teʝ teʘʙtslsʕɖ dʒɖdʝ teʘdʑ dʑs-fɱ teʝ ɘʳ teʝ fɱzteɱsɘ ʋ ʟʙʝ ʕɖfɱsʘdʑʘ ʉ ʙtsteʑɖʕ dʒʘlsʝ teɖʘdʑsɘ ʈ ʝ fɱʃlzʙdʑɖʕʘdʑfɱts ʔ dʑʘlzʮdʑs-lsʝ dʑɖʮʝ fɱts ʔ ʕtsdʑʝ teʝ dʑɭɖɖ.- ʊʘ ʕʝ dʑs, 2007. - ʉ . 163-166.

77. ɸ ʟɖʟtsɘ ʃ .ʊ, ʃ ʝ dʑʜʝ ʙʝ ʕtsɘ ʘ ʉ .ʋ ., ɸ ʟɖʟtsɘ ʊ.ɸ ., ɸ ʟɖʟʏ tsdʑsɘ ʌ.ʃ ., ʉ lzdʝ ʔ dʒ ʘdʑsɘ ʘ ʈ ..ʈ ., ʌʘfɱʘdʑsɘ ʐ ..ɪ ., ʃ ʘdʒlzʜtsɘ ʈ .Ʒ . ʈ ʘʟdʑsʘdʒɖʜdʑ ʝ ʕtststeʜɖdʑʘʮɖtsdʑdʑ ʝ fɱsʝ ʜɖdʝ dʑɖʷ teʷʜʘ ʕʘɐʙtsʕfɱɖdʑlstsɘ dʒʝ lsʘdʑdʑsɘ //ɸ ʕlszʘdʑ dʑ ʝ ʧtetsʙdʝ dʒ fɱsʟʜʘdʑɖʷ ɖ ɖfɱʃtsdʑ ʟtsɘʘdʑɖʷ ɘʳ fɱsʕɖ lsʝ dʑsdʑsɢɖʔ ʧʝ teʝ teʘʙtslsʕɖ dʒɖdʝ teʘdʑ dʑs-fɱ teʝ ɘʳ teʝ fɱzteɱsɘ ʋ ʟʙʝ ʕɖfɱsʘdʑʘ ʉ ʙtsteʑɖʕ dʒʘlsʝ teɖʘdʑsɘ ʈ ʝ fɱ ʧlzʙdʑɖʕʘdʑfɱts ʔ dʑʘlzʮdʑs-lsʝ dʑɖʮʝ fɱts ʔ ʕtsdʑʝ teʝ dʑɭɖɖ.- ʊʘ ʕʝ dʑs, 2007. - ʉ . 30-33.

78. ʉ lzdʝ ʔ dʒ ʘdʑsɘ ʘ ʈ ..ʈ ., ɸ ʟɖʟtsɘ ʊ.ɸ .. ʂ ɘʘdʑstsɘtsɖdʒɖʮʝ fɱtsʝ ɖfɱfɱdʝ ʜtsɘʘdʑɖʝ ʧfɱɘʜtsʘdʒɖʜdʑsɢts ʕtsdʒʃdʝ ʕfɱdʑsɢts fɱsʝ ʜɖdʝ dʑɖʷ ʧʘdʑ dʒɖlsʘlsʘ ʕtsʙʘdʑ lsʘ fɱ ʕʘɐʙʘdʒɖʜtsdʒ ɖ lsɖtsʕʘɐʙʘdʒɖʜtsdʒ //ɪ ʳ fɱsʕtslsʝ dʑsdʑsɢɖʮdʑ ʝ teʘʟteʘʙtslsʕɖ-ʧtetsɖʟɘtsʜfɱsɘlz: dʑʘlzʮdʑs-ʧteʘʕlsɖʮʝ fɱʘʸ ʕtsdʑʝ teʝ dʑɭɖʷ dʒtsdʑtsʜʳ lzʮʝ dʑ ʧtsfɱʷʰ ʝ dʑdʑ ʔ 17-tsʔ ɢtsʜtsɘʰ ɖdʝ dʝ ʟʘɖfɱɖdʒsfɱsɖ ʈ ʝ fɱʃlzʙdʑɖʕɖ ʋ ʟʙʝ ʕɖfɱsʘdʑɖ ʈ tsʜlz dʒtsdʑtsʜʝ ʏ ɖ. ʊʝ ʟ. ʜtsʕdʑ ï ʊʘ ʕʝ dʑs, 2008. - ʉ . 57-58.

79. ʉ lzdʝ ʔ dʒ ʘdʑsɘ ʘ ʈ ..ʈ ., ɸ ʟɖʟtsɘ ʊ.ɸ ., ɸ ʟɖʟtsɘ ʃ .ʊ. ʕ dʝ ʕlstetsdʑdʑ ʝ fɱʃʝ ʕlsteʜɖʷ lzʟdʑsɢts tslsteʘʏ ʝ dʑɖʷ fɱdʒʝ ʰ ʘdʑtsʘdʒɖʜdʑ ʕtsdʒʃdʝ ʕfɱdʑ fɱsʝ ʜɖdʝ dʑɖʔ ʧʘdʑ dʒɖlsʘlsʘʉ ts(II) //ʋ ʟʙ. ɖdʒ ʏ lztedʑ ï ʊʘ ʕʝ dʑs, 2008. -¯ 5. - ʉ .54-57.

80. [illegible] -2005 [illegible] 2009. - [illegible]. 176.

81. [illegible] 1997.- [illegible] 12. - [illegible]. 48-52.

82. [illegible] 1986. - 305 [illegible]

83. [illegible] 1987. - 582 [illegible]

84. [illegible] 1972. - [illegible] 13. - C. 1411-1421.

85. [illegible] 1991. - [illegible]. 60, [illegible] 3.- [illegible].586-594.

86. [illegible] 1998. - [illegible]. 5., [illegible] 1.- [illegible]. 55-58.

87. [illegible] (II, III) 3d-[illegible] 2005.- [illegible] 8.-111-116.

88. Thiessen P.A., Meyer K., Heinicke G. Grundlagen der Tribochemie // Akad. Verlag - Berlin, 1996.- [illegible] 1.- P. 194.

89. Heinicke G. Tribochemistri // Akad. Verlag - Berlin, 1984.- [illegible] 1.-P. 495.

90. [illegible], 1972. - 479 [illegible]

91. [illegible] 1974.- 992 [illegible]

92. ʂ ʘdʑɕʥsɘfʂʘʸ ʀ..I ., ʂ ʘʥʘfɲɟɘ I .ɼ. ʉʧʦfɲʂʙ ʧʦʥʑʯɟʥɕʷ ʢʦʤʃʥɟʢfɲʥʓ ʭ fɲʂɟʜɕʥɟʥɕʔ ʦɟʜʢʦʟɟʥʒʥʑʥʓ ʭ ˩ʥɟʥʒɟʥʂʦʦɘ // ʇʦfɲʑʜʘʥfɲʂɘɟʥʦʥʂɟ ʧʘʂɟʥʂʥʦʥʦɟ ɘɟʜʦʥʒfɲʂɘʦ ʈ ʌ. ʉɘɕʜɟʂɟʥʓ fɲʂɘʦ ¯ 2092440, 12.03.1996 ɢ.

93. ɿ ʦɕʰ ɕʙʥɿ. ʂ ʦʥʃʥɟʢfɲʂʥʓ ɘ ʭɕʤʒɕʯɟ fɲʂʦʥʒ ʘʥʘʥɕʟɟ. ï ʄ ʦfɲʂɘʘ ʀ ʃ. 1960. -72 fɲ

94. ʂ ʥɕʥʒʦɘʘ I .ɸ. ʃ fɲʥʦɘʳ ʤɕʢʦʦʥʒ ʂʦʜʘ ʘʥʘʥɕʟʘ ʦʦɢʘʥɕʯɟ fɲʂɕʭ fɲʂɟʜɕʥɟʥɕʔ. ï ʄ ʦfɲʂɘʘ ʍɕʥʒɕʷ, 1967. ï 19 с.

95. ʂ ʦɘʙʘɿ .ʄ ., ʊʦʥʑʥʦɘ I .ʂ. ʈɟʥʂɢɟʥʦʬ ʘʟʦɘʳ ʔ ʘʥʘʥɕʟ.- ʄ .: ʄ ʇʋ, 1976. ï 232 fɲ

96. ʇ ɕʥʥɟʦɕ ɕ .ʃ. ʊʘʙʥɕʯʳ ʥɟʞʧʥʦfɲʂʦfɲʂʥʓ ʭ ʦʘfɲfɲʂʦʷʥɕʔ.- ʄ ʦfɲʂɘʘ ʅɟʜʦʘ, 1966. ʊ.1. ï 362 fɲ

97. ʅɟʜʦʥʒʘ ʀ. ʈʘfɲ ɕʬʦʦɘʢʘ ʦɟʥʂɢɟʥʂɢʦʘʥʒʥʒ ʧʦʦʦʰ ʢʦɘ. ï ʄ ʦfɲʂɘʘ ʄ ɟʂʘʥʥʑʦɢɕʷ, 1975. ï 423 fɲ

98. Paulik F., Paulik J., Erdey L. Derivatograph. I Mittelung Ein automatish registriender Apparat zur gleichzeitigen Ausguchrund der Differential ï ther moqravimetrischen Untersuchungen //Z. Anal. Chem. ï Berlin, 1958. -V.160., ¯ 4. - P. 241-250.

99. ʂ ʑʟʥʯʦɘʘ ʇ.ɸ. ʂ ʘʯfɲʂɘɟʥʓ ʔ ʦɟʥʂɢɟʥʦʬ ʘʟʦɘʳ ʔ ʘʥʘʥɕʟ. ï ʀ ʦʢʑʂfɲʂ: 2005. ï 28 fɲ

100. ʅ ʘʢʘʥʒʂʂʦ ʂ. ʀʂ-fɲʃɟʢʂʦ ɕ fɲʃɟʢʂʦ ʂʈ ʥʦʦɢʘʥɕʯɟ fɲʂɕʭ ɕ ʢʦʦʦʜɕʥʘʯɕʦʥʓ ʭ fɲʂɟʜɕʥɟʥɕʔ. ï ʄ ʦfɲʂɘʘ ʄ ɕʦ, 1991.- 536 с.

101. ʍʘfɲʘʥʦɘ ʐ . ɪ., ɸʟɕʟʦɘ ʃ . ʊ., ɸʟɕʟʦɘ ʊ. ɸ. ʉʥɟʰ ʘʥʦʘʥʒɕʜʥʓ ɟ ʢʦʦʦʜɕʥʘʯɕʦʥʓ ɟ fɲʂɟʜɕʥɟʥɕʷ fɲʂɟʘʘʂʘ ʥʢʢɟʥʸ (II)// ʋʟʙ. ʭɕʥʒ ʞʑʦʥʓ ï ʊʘ ʢɟʥʂ, 2010. -¯ 5. - ʉ.11-14.

102. ʍʘfɲʘʥʦɘ ʐ ..ɪ ., ɸʟɕʟʦɘ ʃ . ʊ., ɸʟɕʟʦɘ ʊ. ɸ. ʀʂ - fɲʃɟʢʂʦʦfɲʂʦʧɕʯɟ fɲʂʦɟ ɕfɲfɲʥʜʦɘʘʥɕɟ ʦʘʟʥʦʘʥʒɕʜʥʓ ʭ ʢʦʦʦʜɕʥʘʯɕʦʥʓ ʭ fɲʂɟʜɕʥɟʥɕʔ fɲʂɟʘʘʂʘ ʥɟʜɕ (II)//ʈɟfɲʑʙʥɕʢʘʥfɲʂʘʸ ʥʘʑʯʥʦ-ʂɟʭʥɕʯɟ fɲʂʘʸ ʢʦʥʬɟʦɟʥʟɕʷ «ʈʘʟʦʘʙʦʂʢʘɕ ɘʥɟʜʦɟʥɕɟ ɘ ʧʦʘʢʂɕʢʑ ˩ʬʬɟʢʂɕɘʥʓ ʭ ʂɟʭʥʦʥʦɢɕʔ

[illegible] (II)// [illegible], 2010. - [illegible].177-179.

103. [illegible] (II)// [illegible], 2010. [illegible] 23 (62), [illegible] 2.- [illegible]. 263-269.

104. [illegible] (II)// [illegible], 2010. -[illegible] 3. - [illegible].71-74.

105. [illegible] (II)// [illegible], 2011.- [illegible].33.

106. [illegible] (II)// [illegible], 2010. - [illegible].179-180.