

8-OXSIXINOLINING Zn^{2+} BILAN ARALASH LIGANDLI KOMPLEKSI SINTEZI VA TADQIQOTI

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ANNOTATSIYA

Ushbu tadqiqot ishida 8-oksixinolin (8-HQ) ligandining (L), Zn^{2+} bilan EDA ishtirokida aralash ligandli kompleks birikmasi sintez qilindi. Uni strukturaviy tavsiflash uchun IQ- spektroskopiyasidan foydalanilgan. IQ-spektr tahlilida olingan natijalar bilan nazariy ma'lumotlardagi tegishli bog'larning tebranish chastotalari mos ekanligi aniqlandi.

Kalit so'zlar: 8-oksixinolin, ligand, metall kompleksi, IQ-spektr.

СИНТЕЗ И ИССЛЕДОВАНИЕ 8-ОКСИХИНОЛИНА С ЛИГАНДНЫМ КОМПЛЕКСОМ СМЕШИВАНИЯ С Zn^{2+}

АННОТАЦИЯ

В данном исследовании был синтезирован смешанолигандный комплекс 8-гидроксихинолинового (8-HQ) лиганда (L) с Zn^{2+} на основе ЭДА. Для описания его структуры был использован метод ИК-спектроскопии, которым было установлено, что частоты колебаний соответствующих связей в теоретических данных согласуются с полученными результатами.

Ключевые слова: 8-оксихинолин, лиганд, металлокомплекс, ИК-спектр.

SYNTHESIS AND RESEARCH OF 8-OXYQUINOLINE WITH A MIXING LIGAND COMPLEX WITH Zn^{2+}

ABSTRACT

In this study, a mixed ligand complex of 8-hydroxyquinoline (8-HQ) ligand (L) with Zn^{2+} based on EDA was synthesized. To describe its structure was used by the IR spectroscopy, which it was found that the vibrational frequencies of the corresponding bonds in the theoretical data are consistent with the results have been obtained.

Keywords: 8-hydroxyquinoline, ligand, IR-spectroscopy, metal complex.

KIRISH

Tadqiqotimiz obykti bioaktiv xususiyatga ega bo'lgan 8-oksixinolin (L) va uning etilendiamin (EDA) ishtirokida Zn^{2+} bilan sintez qilingan $[Zn(L)_2(MDA)]$ tarkibli kompleks birikmasi hisoblanadi. Tadqiqotlarimiz uchun zarur bo'lgan ligand [L] 8-oksixinolin va sintez qilingan kompleksning IQ -spektri Yaponiyada ishlab chiqarilgan SHIMADZU IQ- Furye spektrofotometrida $600-4000\text{ sm}^{-1}$ sohada olindi.

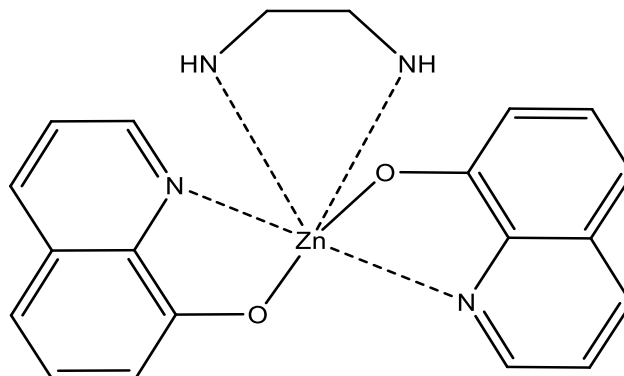
ADABIYOTLAR TAHLILI VA METODOLOGIYA

Shiff asoslari koordinatsion kimyoning rivojlanishida muhim o'rin tutadi hamda noorganik kimyo, biokimyo va optik materiallarni ishlab chiqarishda muhim mahsulot sifatida ishtirok etadi. [1] Bugungi kunda metal Shiff komplekslari keng o'rganilmoqda, chunki ular sanoat, antifungal va biologik preparatlar ishlab chiqarish sohasining rivojlanishida shuningdek siydik yo'llari infeksiyalarini davolashda 5-(3,4,5-trimetoksibenzil)primidin-2,4-diamin (trimetoprim) antibiotigi muhim ahamiyat kasb etadi [2,3]. O va N donor atomlarini o'z ichiga olgan hamda metall ionlari bilan kompleks birikmalar hosil qiladigan xelatlovchi ligandlar keng biologik faollik va turli xil bog'lanish turlari tufayli alohida qiziqish uyg'otadi [4]. Aralash ligand komplekslari biologik ahamiyatga ega bo'lganligi uchun ham keng o'rganilgan [5-6, 7] Trimetoprimning aralash metall komplekslari haqida bir qancha ma'lumotlar mavjud [8]. Shunday qilib, aralash ligand komplekslarining sintezi, harakteristikasi va biologik tadqiqotlarini o'rganish muhim ahamiyatga ega. Trimetoprim va 2-benzoilbenzoy kislotasi Shiff asosi va 8-gidroksixinolin bilan aralash ligand komplekslari shular jumlasidandir. 8-oksixinolin yoki uning hosilalari ishtirokida sintez qilingan kompleks birikmalar o'simliklarda, qishloq xo'jaligida fungitsid va konservant sifatida ishlatiladi. Qolaversa to'qimachilik, yog'ochsozlik va qog'oz sanoatida hamda keng tarqalgan metallarning komplekslarini hosil qilish uchun ishlatiladi [8,9-10]. Barcha 8-oksixinolin hosilalarini insektitsidlar, antibakteriallar, fungitsidlar, neyroprotektivlar va OIV ga qarshi vositalar sifatida tibbiyotda qo'llash mumkin. [12-14] Sintezda ushbu tadqiqotning maqsadi, fizik-kimyoviy tadqiqotlar yordamida Rux (II) ning koordinatsion birikmasi yangi Shiff bilan asosiy ligand sifatida kompleks hosil qilgani o'rganildi.

NATIJALAR

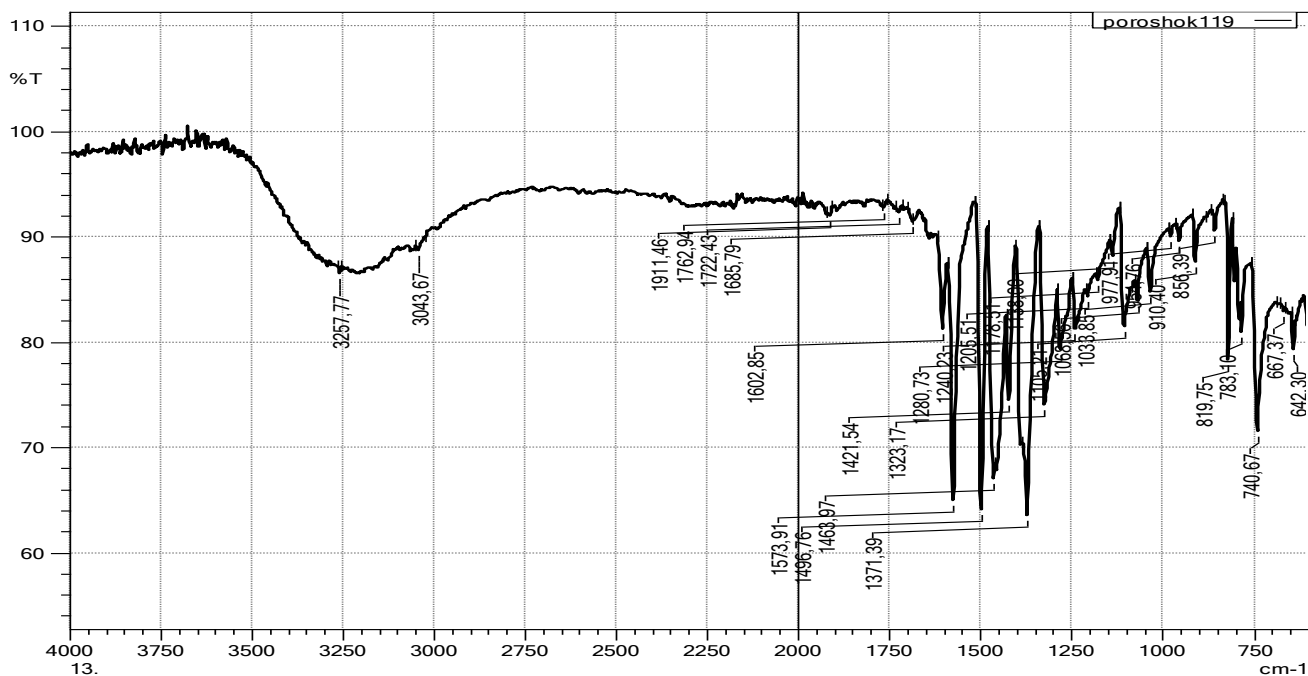
$ZnSO_4 \cdot 7H_2O$ 1 ml distillangan suvda eritildi, Zn^{2+} va ligand (8-HQ) ni 1:2 molyar nisbatdagi eritmasi tayyorlandi, ligandni 96 % li etil spirt eritmasida eritib, aralash ligand sifatida EDA eritmasidan tomizildi, keyin ligand eritmasini tuz eritmasiga quyildi va magnitli aralashtirgichda qizdirib qo'yildi. Eritmada loyqalanish

kuzatilgani sababli konsentrlangan HNO_3 eritmasidan 1-2 tomchi qo‘shildi. Magnitli aralashtirgichda 60°C haroratda 30 daqiqa davomida qizdirib, aralashtirildi. So‘ngra xona haroratida 10 kun qoldirildi. Sekinlik bilan eritma tarkibidagi suyuqliklar bug‘lanib idish tubida krisllar hosil bo‘la boshladi.



1-rasm. $[\text{Zn}(\text{C}_9\text{H}_7\text{NO})_2(\text{C}_2\text{H}_8\text{N}_2)]$ kompleksining tarkibi va tuzilishi

8-oksixinolin va sintez qilingan $[\text{Zn}(\text{C}_9\text{H}_7\text{NO})_2(\text{C}_2\text{H}_8\text{N}_2)]$ tarkibli kompleksning fizik-kimyoviy tahlili, tarkibi va tuzulishi IQ-spektr qurilmasi (IK-Furye, SHIMADZU, Yaponiya) yordamida o‘rganildi.



2- rasm. $[\text{Zn}(\text{C}_9\text{H}_7\text{NO})_2(\text{C}_2\text{H}_8\text{N}_2)]$ kompleksining IQ-spektri

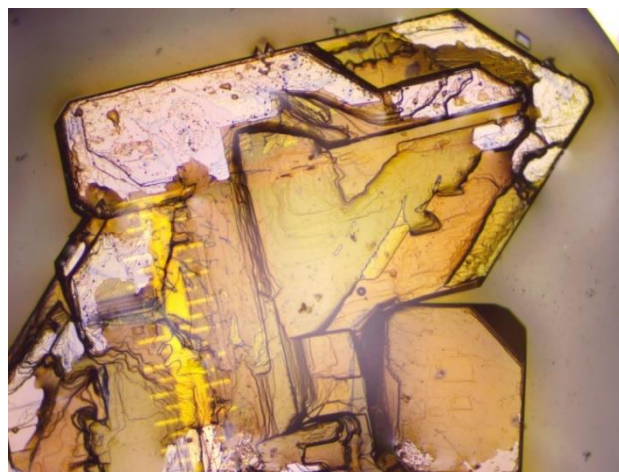
Olingan tahlil natijalariga ko‘ra, spektrning 3257.77cm^{-1} sohasida NH guruhining yuqori intensivlikka ega bo‘lgan valent tebranishli chastotasi, 3043.67cm^{-1} sohada OH (H bog‘ hosil qilgan) bog‘iga mos valent tebranish chastotasi, $2362.80, 02\text{cm}^{-1}$ sohada esa CH_2 - bog‘iga mos assimetrik valent tebranish, $1573,91\text{cm}^{-1}$ sohada

C=N bog'ining valent tebranishi, 1240.23 cm^{-1} sohada C-N bog'iga mos valent tebranish va 667.37 cm^{-1} sohada O-Zn bog'ining valent tebranish chastotalari ham kuzatildi.

2-jadval

<i>IQ- spektrlaridagi tebranish chastotalari, cm^{-1}</i>		<i>Bog'lanishlar</i>
<i>8-oksixinolin (L)</i>	<i>[Zn(C₉H₇NO)₂(C₂H₈N₂)]</i>	
—	3257.77	(v) NH
3219.19	3043.67	(v) OH
1577.7	2362.80	(ν_{as}) CH ₂
1273.02	1573.91	(v) C=N
—	1240.23	(v) C-N
—	667.37	(v) O-Zn

1-jadval. Ligand va kompleks birikma tarkibidagi bog'larning IQ-spektri tebranish chastotalari.



Kristallning mikroskopda ko'rinishi.

MUHOKAMA

Dunyoda tegishli ilmiy-tadqiqot markazlarda geterosiklik birikmalarning metallokomplekslari va ularning biologik faolligini oshirish bo'yicha qator, jumladan, quyidagi ustuvor yo'nalishlarda tadqiqotlar olib borilmoqda: komplekslarda markaziy metall kationiga ligandlarning koordinatsiya bo'lishini nazorat qiluvchi omillarni aniqlash; aralash-ligandli barqaror xelat birikmalar sintez qilish; xelat birikmalar asosida biologik faol moddalarni olish va ta'sir mexanizmlarini aniqlash; ekologik toza, tannarxi arzon va kichik konsentratsiyalarda yuqori samarali preparatlarni ishlab chiqish muhim ahamiyat kasb etganligi sababli Zn²⁺ ning 8-oksixinolin bilan kompleks

birikmasini hosil qilish va o'rganish ham bugungi kunda kimyogarlar oldida turgan dolzarb masalalardan biridir. Xususan ushbu maqolada yoritilgani kabi Zn^{2+} ning 8-oksixinolin bilan kompleks birikmasi sintez qilindi va IQ- spektri yordamida natijalar tahlili o'rganildi.

XULOSA

Kompleks sintez qilishda boshlang'ich moddalarning mol nisbatlari sintez qilingan kompleksning tarkibi va fizik-kimyoviy xususiyatlariga ta'siri tekshirildi va ma'qul sharoitlari o'rganildi. Zn^{2+} ionining 8-oksixinolin va etilendiamin bilan hosil qilgan aralash ligandli kompleks birikmasi IQ- spektri natijalari asosida tahlil qilindi. Shuning sintez qilingan kristallarning optik mikroskopda tuzilishi keltirib o'tildi.

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