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PIRAZOLNING TUZILISHI VA UNING XOSSALARI

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ANNOTATSIYA

Ushbu maqolada Kimyo fani oldida turgan masalalar, organik kimyoning xalq xo`jaligidagi ahamiyati, sanoat va tibbiyotda keng qo`llaniladigan Pirazol, uning tuzilishi, umumiy va o`ziga xos xususiyatlari tahlil qilingan.

Kalit so`zlar: organik kimyo, tabiiy xosita, pirazol, asetilen, diazometan, alanin, fenpiroksimat, selekoksib, gidrazin.

ABSTRACT

This article analyzes the problems facing the science of chemistry, the importance of organic chemistry in the national economy, Pyrazole, which is widely used in industry and medicine, its structure, general and specific properties.

Keywords: organic chemistry, natural properties, pyrazole, acetylene, diazomethane, alanine, phenpiroximate, celecoxib, hydrazine.

KIRISH

Ishlab chiqarish texnologiyalarining yangilanayotganligi, fan kashfiyotlari va texnikani bevosita ishlab chiqarish kuchiga aylanib borishi mutaxassis kadrlardan o‘z bilimlarini mustaqil va muntazam ravishda chuqurlashtirib, yangilab, to‘ldirib va kengaytirib borishni talab etadi. Kimyo fanini ham oliy va o`rta maxsus va xalq ta`limida ham alohida yondashuv bilan interfaol va zamonaviy texnolagiyalar asosida o`rganish zamon talabiga aylanib ulgurdi. O‘zR FA polimerlar fizikasi va kimyosi instituti (PFKI) sintetik va tabiiy polimerlar sohasi bo‘yicha O‘zbekistonda yetakchi ilmiy muassasa hisoblanadi. PFKI olimlari polimerlar fizikasi va kimyosining fundamental hamda amaliy muammolarni ishlab chiqishda munosib hissa qo‘shmoqdalar. Ular qishloq xo‘jaligi va tibbiyot uchun biologik faol polimerlarni sintez qilish, kimyoviy modifikatsiyalash usuli orqali tibbiyotda, ekologiyada, farmatsevtikada keng qo‘llanilishi mumkin bo‘lgan polisaxaridlar olish, paxta momig‘idan turli maqsadlarda ishlatiladigan selluloza olish texnologiyasini ishlab chiqish singari ilmiy muammolarni yechish borasida katta yutuqlarga erishdilar. Qishloq xo`jaligi tarmoqlari va tibbiyotda Pirazol va uning xosilalari juda ahamiyatli hisoblanib, uning tuzilishini o`rganish fan uchun lozimdir.

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ADABIYOTLAR RO‘YXATI VA METODOLOGIYA

Pirazol atamasi bu birikmalar sinfiga 1883-yilda nemis kimyogari Lyudvig Norr tomonidan berilgan.[1] 1898 yilda nemis kimyogari Xans fon Pechmann tomonidan ishlab chiqarilgan klassik usulda pirazol asetilen va diazometandan sintez qilingan.

1959-yilda tarvuz urug'laridan birinchi tabiiy pirazol 1-pirazolil-alanin ajratib olindi.[2]

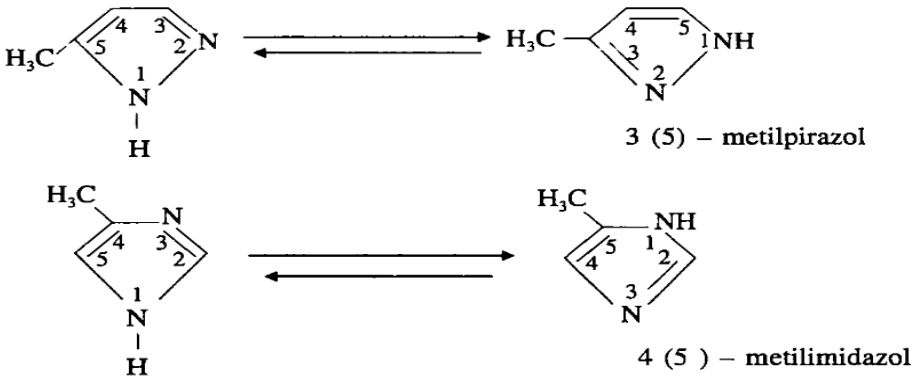
Tibbiyotda pirazol hosilalari keng qo'llaniladi[3].

Pirazol halqasi fungitsidlar, hasharotlar va gerbitsidlar, jumladan fenpiroksimat, fipronil, tebufenpirad va tolfenpyrad kabi turli xil pestitsidlarda uchraydi. Pirazol qismlari AQSh FDA tomonidan kichik molekulali dorilar uchun juda ko'p ishlatiladigan halqa tizimlari ro'yxatiga kiritilgan.

Pirazol -bu $C_3H_3N_2H$ formulali organik birikma, bu uchta uglerod atomining 5a'zoli halqasi va ikkita qo'shni azot atomining xarakteristikasi bo'lgan heterosik[4]. Pirazol kuchsiz asos bo'lib, p K_b 11,5 ga teng ($25\ ^\circ C$ da konjugatsiyalangan kislotaning 2.49 p K_a). [2] Pirazolalar, shuningdek, qo'shni azot atomlari bilan C_3N_2 halqasiga ega bo'lgan birikmalar sinfidir . [3] Pirazol halqasini o'z ichiga olgan taniqli dorilar selekoksib (Celebrex) va stanozolol anabolik steroididir.

Pirazolda uchta uglerod atomining bittadan uchta elektroni hamda ikkita azot atomining uchta elektroni hisobidan yopiq л - elektronli sekstet hosil boladi. Shu bois bu geterot sikllar aromatik xossalarni namoyon qiladi.Pirazol va imidazolning tuzilish formulalariga qaraganda, ular halqasidagi azot atomlaridan bittasi piridinning azotatomiga, ikkinchisi e sa pirrolning azot atomiga o‘xshaydi.Bunday tuzilishda 3- va 5-almashingan pirazollar, shu-ningdek, 4- va 5-almashingan imidazollar mavjud bo‘lishi kerak. Lekin pirazol va imidazoldagi harakatchan vodorod atomi bir azot atomidan boshqasiga tez o’tib turganligi sababli bunday izomerlar hosil bo‘lmaydi. Pirazol va imidazol molekulalaridagi har ikkala azotatomi teng qiymatli. Shuning uchun ham pirazoldagi 3- va 5-imidazoldagi 4- va 5-holatlar amalda bir-biridan farq qilmaydi. Shu bois pirazolning 3- va 5-uglerod atomlaridagi almashinish 3 (5) - yoki 5 (3) - almashinish, imidazolning 4- va 5- holatlaridagi almashinish esa 4(5)- yoki 5(4)- almashinish deb belgilanadi:

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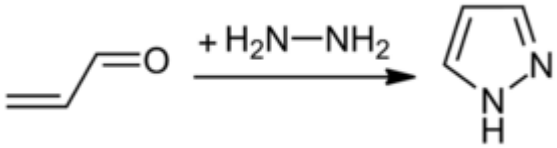


Pirazol va imidazol halqalarining aromatik xarakteri ularningoksidlovchilar ta‘siriga chidamliligida, birikish reaksiyalariga moyil emasligida, shuningdek, elektrofil almashinishreaksiyalariga oson kirishishida namoyon bo’ladi. Pirazoldaham, imidazolda ham elektrofil almashinish halqaning 4-holatida boradi.

NATIJALAR

Pirazol 69°C da suyuqlanadigan, suvda, spirtda, efirda va benzolda yaxshi eriydigan piridin hidli kristall modda. Pirazol va uning hosilalari tabiatda topilmagan.

Pirazollar a, b-to'yinmagan aldegidlarning gidrazin bilan reaktsiyasi va keyinchalik dehidrogenlash orqali sintezlanadi: [4]

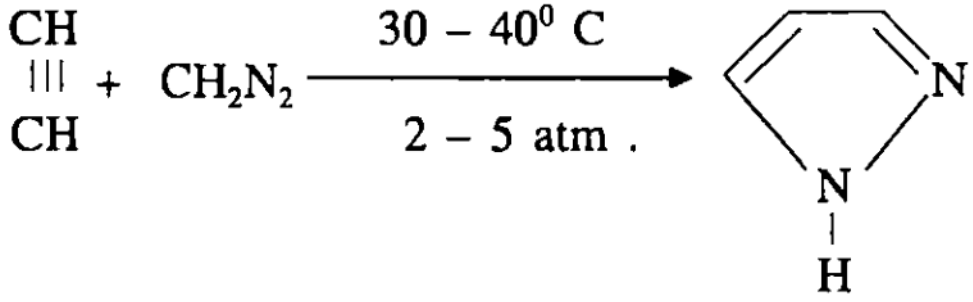


O'rniga qo'yilgan pirazolalar 1,3- diketonlarni gidrazin bilan kondensatlash yo'li bilan tayyorlanadi (Norr tipidagi reaktsiyalar). [5] Masalan, atsetilaseton va gidrazin 3,5-dimetilpirazol beradi: [6]

$CH_3C(O)CH_2C(O)CH_3 + N_2H_4 \rightarrow (CH_3)_2C_3HN_2H + 2H_2O$

Pirazollar quyidagi reaksiyalar bilan olinadi:

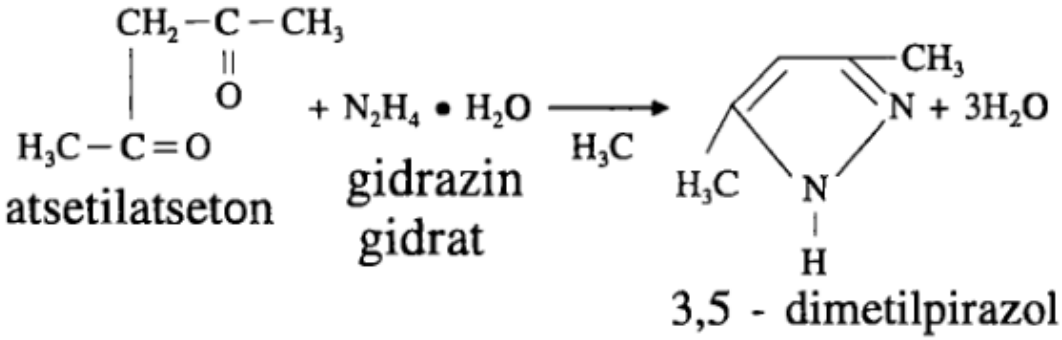
1. Alkinlarga diazometan birikkanda pirazollar hosil bo’ladi



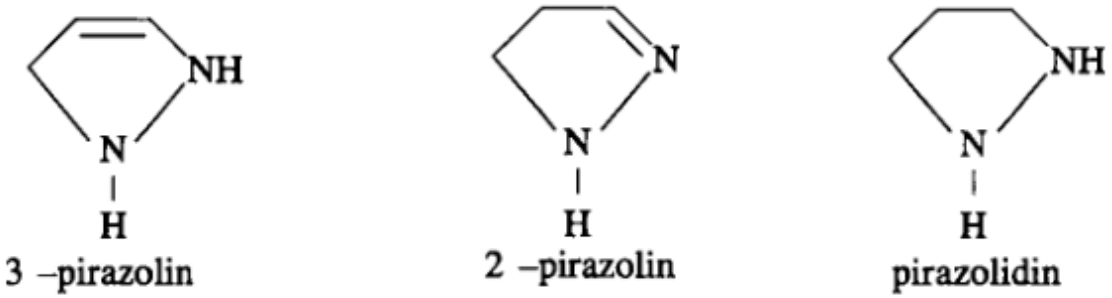
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2. Pirazol gomologlari 1,3 - dikarbonil birikmalar va gidrazinyoki uning hosilalaridan sintez qilinadi:

3.



Pirazol kuchsiz asos va kuchsiz kislota xossalarini namoyonqiladi. Uning azot bilan bog‘langan vodorod atomi ishqoriy metallarga, magniy va kumushga oson almashinadi. Pirazolni sulfolash juda qattiq sharoitda boradi. 3-metilpirazolni 20% li oleum da 6 soat davomida 100° C gacha qizdirganda sulfoguruh 4 - holatga kiradi: Pirazolni nitrolash ham qattiq sharoitda boradi. Pirazolni qisman qaytarganda pirazolinlar, to‘liq qaytarganda esa pirazolidin hosil bo‘ladi:

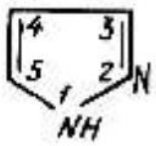


Pirazolinlar reaksiyaga kirishish qobiliyati kuchli birikmalardir. Pirazol hosilalari dori preparatlari (piramidon, analgin, arisul), bo‘yoqlar, insektitsidlar sifatida va boshqa maqsadlarda ishlatiladi.[5]

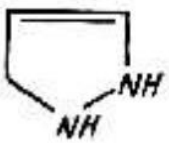
MUHOKAMA

Tibbiyot amaliyotida pirazolin va pirazolidin hosilalari analgetik shamollashga qarshi va isitma tushiruvchi dori vositalari sifatida qo’llaniladi.

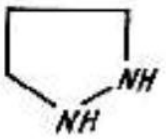
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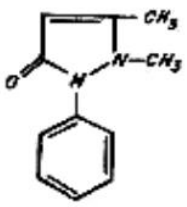
Pirazol

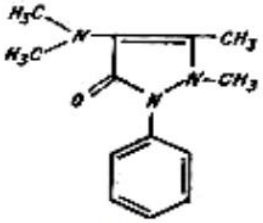


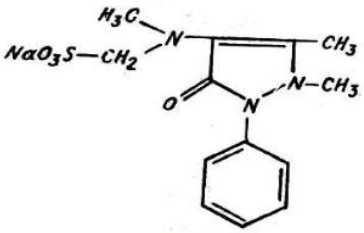
Pirazolin

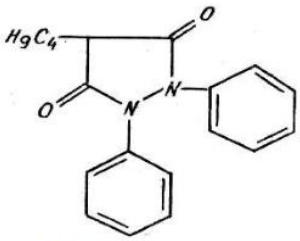


Piraazolidin


Antipyrinum


Amidopyrinum


Analginum

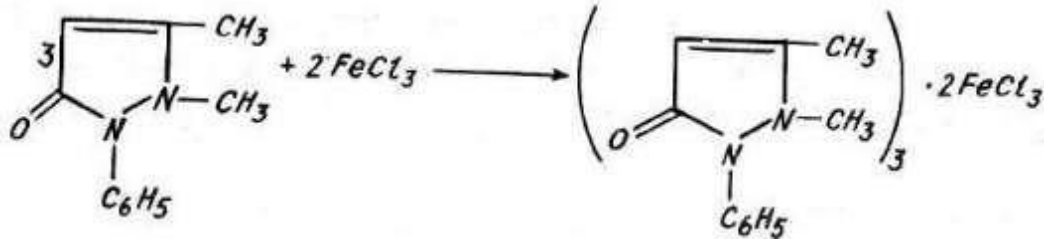

Butadionum

Tasvirlanishi.

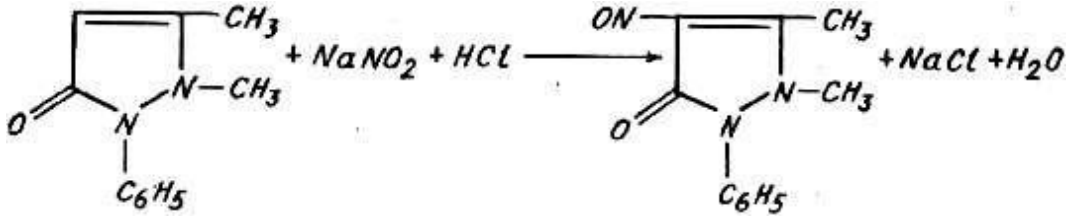
Bu dori moddalar oq yoki oq sarg'ish kristall poroshok, suvda antipirin va analgin oson eriydi, butadion erimaydi. Butadion ishqor eritmalarida va xloroformda eriydi. Analgin namlik ta'sirida parchalanadi.

Chinligini aniqlash.

1. Antipirin $FeSl_3$ eritmasi bilan $(antipirin)_3$ .2 $FeSl_3$ tarkibli (qizil rangli) ferripirin hosil qiladi.



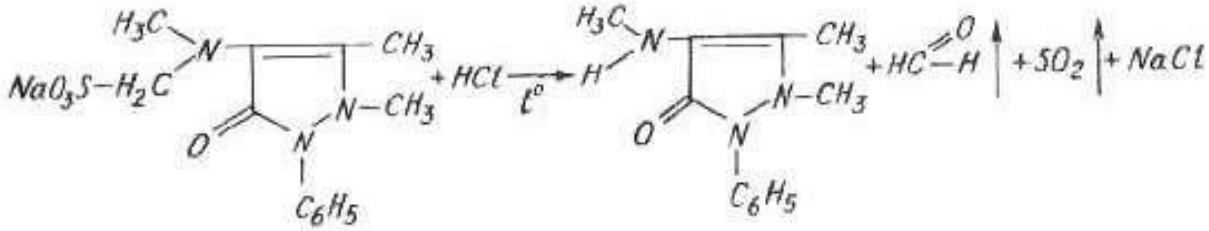
2. Antipirin $NaNO_2$ eritmasi bilan kislotali sharoitda izumrud-yashil rangli nitrozoantipirin hosil qiladi.



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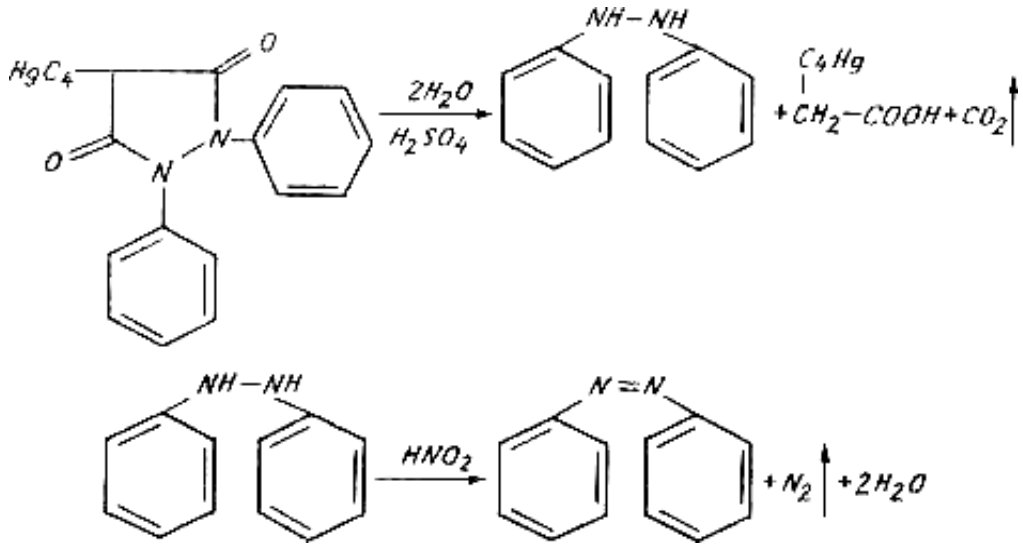
3. Analgin kislotali sharoitda KJO_3 eritmasi bilan to'q qizil rangli oksidlanish mahsuloti hosil qiladi.

4. Analgin NSl suyultirilgan eritmasi bilan qizdirilganda SO_2 ni hidi seziladi (antipirin va amidopirindan farqi).

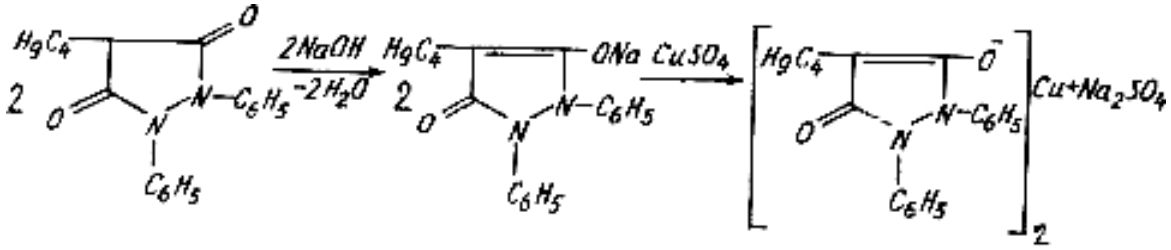


$$5SO_2 + 2KJO_3 \rightarrow K_2SO_4 + 4SO_3 + J_2$$

5. Butadion konts. N_2SO_4 ishtirokida $NaNO_2$ eritmasi bilan qizdirilsa qizil rangli azobenzol hosil qiladi.

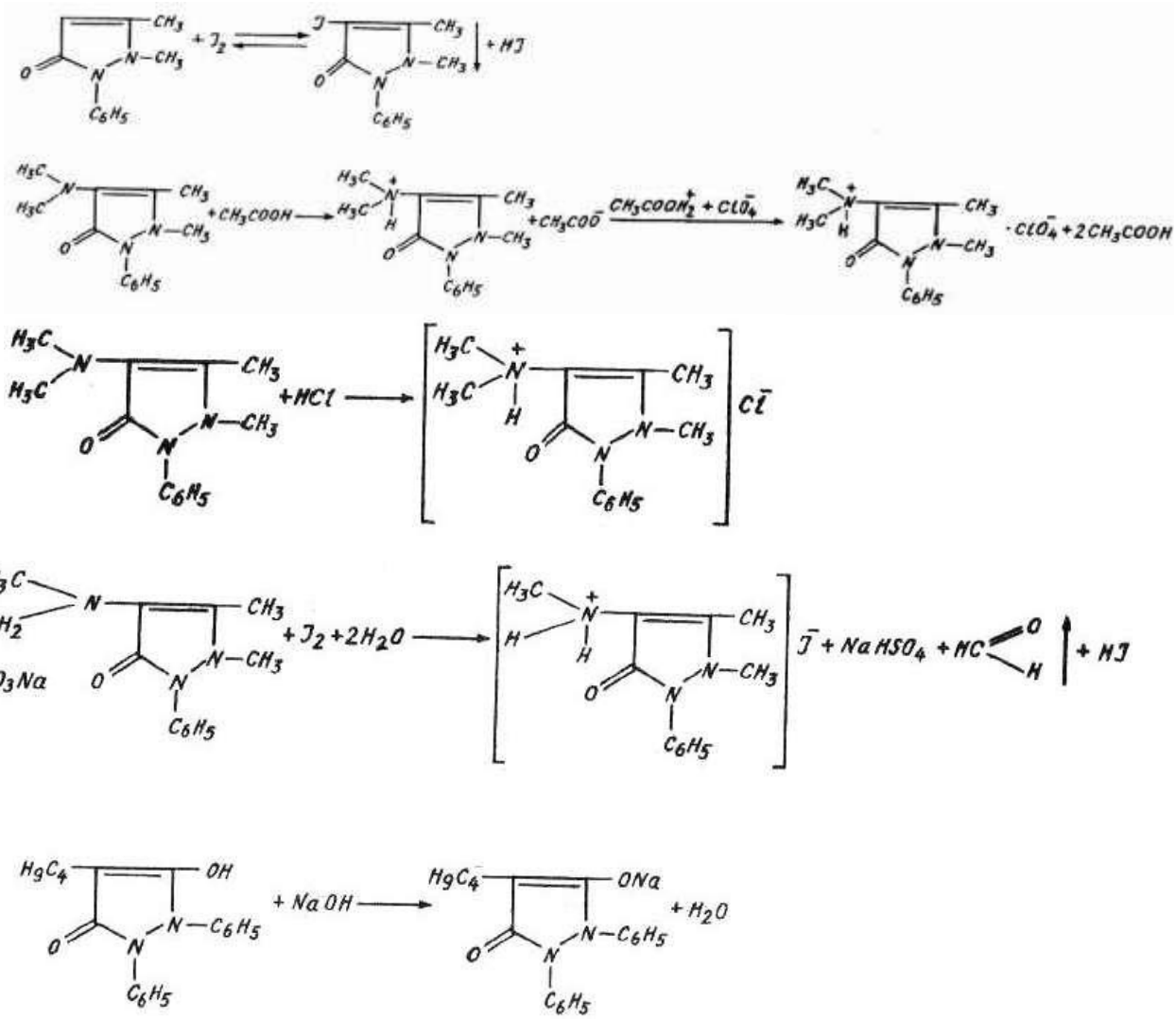


6. Butadionning Na li tuzi og'ir metallarning tuzlari bilan ($SuSO_4$) yashil rangli cho'kma hosil qiladi.



Miqdorini aniqlash. Antipirin, analgin yodometrik, butadion (amidorin) kislotali asosli titrlash usuli

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Ishlatilishi. Og'iq qoldiruvchi, shamollashga qarshi va isitma tushiruvchi vosita. Saqlanishi. B-ro'yxati bo'yicha saqlanadi.

XULOSA

Geterotsiklik birikmalar organik moddalar qatoriga kiradi va tabiatda ko'p tarqalgan bo'lib, sanoatda keng miqyosda qo'llaniladi. Hozirgi paytda eng muhim va keng ko'lamda qo'llanilayotgan dori moddalarning 60 % dan ko'p miqdori geterotsiklik birikmalardir. Halqada turli xil geteroatomlarning bo'lishi moddaning o'ziga xos kimyoviy xossalarni namoyon qilishiga olib keladi.

Pirazol pirrolga o'xshab – kuchsiz asos va bir vaqtning o'zida kuchsiz kislotadir.

Pirazol rangsiz kristall. Pirroldan farqli ravishda u 2-azot atomining bo'lishi bilan aloqalarda asoslik xususiyatni aniq ifodalaydi. Pirazol aromatiklik xususiyatiga ega, u tiofenga qaraganda oson sulfolanadi, nitrolanadi.

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Pirazol 69-70 Cda qaynaydi, piridinga o’xshash hidli, suvda, spirtda, efirda va benzolda yaxshi eriydi.

Pirazol uchun elektrofil almashinish reaksiyalaridan alkillanish, atsillanish, nitrolanish, sulfolanish, galogenlanish reaksiyalari harakterli ekanligini ko’ramiz.

Benzol va pirazol halqasining kondensatsiya qilingan sistemasi – indazol benzimidazol bilan solishtirilganda –indazol – kam o’rganilgan, va faqat keyingi vaqtlarda bu birikmaga ximiklarning qiziqishi ancha oshdi. Indazol tabiiy moddalar tarkibida topilmagan.

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