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Synthesis, Characterization of tridentate Hydrazones Schiff bases from AroylCarboxaldehyde and their complexes with Transitional Fe $^{3+,}$ Cr^{3+}metal ion

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Abstract- PEB-1,PEB-2 hydrazone Schiff base ligands were synthesized from substituted benzhydrazide with 4 methyl 2-acetylpyridine andbenzhydrazide with 4 methyl pyridine-2-carboxaldehyde by refluxing in ethanolic medium with acidification from conc.H_2SO_4respectively.

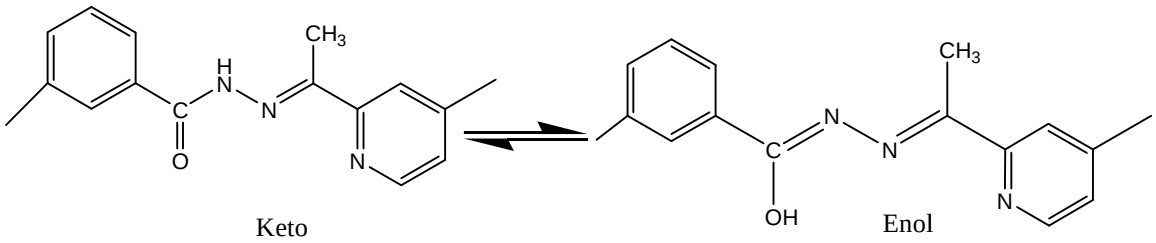
PEB-1,PEB-2 hydrazone Schiff base ligands shows remarkable triatomic moieties >C=O-N-N< functional ligacy in complexation behavior with transitional metal like $Fe^{3+,}$ Cr^{3+}ion. The carbonyl functionality, azomethine group and pyridine residual part clearly shown by spectral characterization IR, H^1&C^{13} NMR and Mass spectroscopy. All hydrazone Schiff base ligands contain chromophore which shows fluorescence's &absorption phenomenon was analysed by UV spectroscopy.

Key words- Hydrazone, Fe $^{3+,}$ Cr^{3+}, benzhydrazide , 4 methyl 2-acetylpyridine and4 methyl pyridine-2-carboxaldehyde .

Introduction-Aryl, Aroylhydrazone Schiff base forms complexes with transitional metal ion due to its variable & higher oxidation state[1,2,3,4] The complexes of such significantly applicable in pharmacological, biological screening against various strain of pathogens.

In analytical chemistry hydrazones find application by acting as multidentate ligands [5,6] with metals (usually from the transition group). Various studies have also shown that the azomethine group having a lone pair of electrons in either a p or sp2 hybridized orbital on trigonally hybridized nitrogen has considerable biological importance [7].The hydrazone Schiff base >C=O-N-N< shows clearly keto-enoltautomerism can link metal ion in neutral medium in medicinal application [8].The structural aspects of these hydrazonecomplexes revealed manyinteresting facts, such as theirtendency and potency towards planar pentadentate,

hexadentate ligands in the complexes [9–12].It is well-known that many hydrazones and their correspondingmetal complexes have displayed diverse spectra of biological and pharmaceutical activities, such as anticancer, antitumor andantioxidative activities, as well as the inhibition of lipidperoxidation etc.[13–19]



Keto Enol

In this article we tried to explain synthesis, structural aspect of schiff base ligands, fluorescent, and absorption phenomenon of transional metal complexes.

Experimental-

Material- All chemical were purchased from Merck ltd, Avra Synthesis Ltd. in analytical grade. 4 methyl 2-acetylpyridine and 3 methyl benzhydrazide4 methyl pyridine-2-carboxaldehyde. The solvent are purified by Rota Vapour.

Synthesis –

Synthesis of PEB1,PEB2:-

Synthesis of PEB1 & PEB2 type Schiff baseligands were synthesized from reacting of 3-methylbenzohydrazide, with 4 methyl 2-acetylpyridineand 3-methylbenzohydraziderespectively. The reaction mixture slightly acidified by 0.5 ml of conc. H_2SO_4. The both precursors were reacting in equimolarstochiometricratio with 2 mmolequantities in pure 25 ml quantity of ethanolic medium which was refluxed 4-5 hours to yield yellow colored hydrazone ligand.The percentage yield 80-85 % obtained. The crude product washed&recrystallised from ethanol. It is termed asPEB1 & PEB2 type Schiff baseligands.

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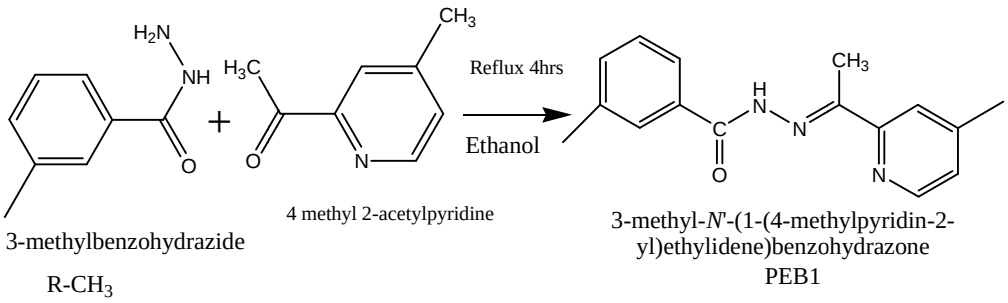


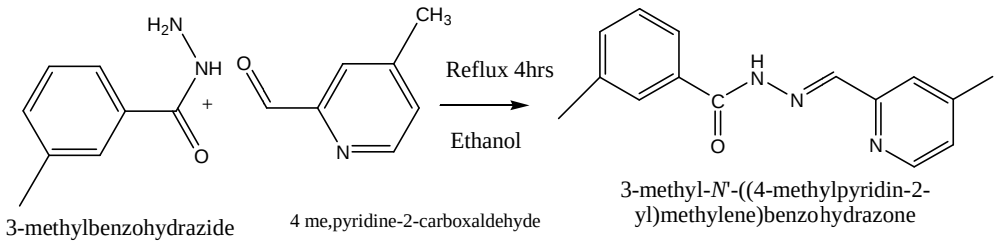
3-methylbenzohydrazide

R-CH_3

4 methyl 2-acetylpyridine

3-methyl-*N*'-(1-(4-methylpyridin-2-yl)ethylidene)benzohydrazone

PEB1



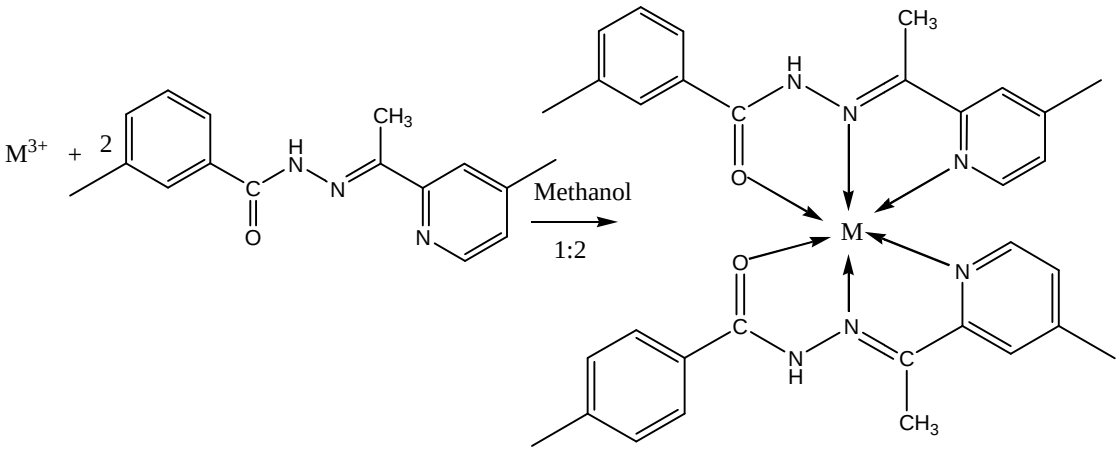
3-methylbenzohydrazide

4 me,pyridine-2-carboxaldehyde

3-methyl-*N*'-((4-methylpyridin-2-yl)methylene)benzohydrazone

PEB2

Synthesis of Metal Complexes:- The ferric salt and Chromium salt are dissolved in methanol 25 ml separately.The quantities ofwith 1:2 ratio of both PEB-1 and ferric salt as well as PEB-1 and Chromium salt solution in taken in 25 ml methanol separately taken. The same procedure carried with PEB-2 for second complex. The reaction mixture refluxed for 2-3 hours by maintainingmedium 7-8 PH. The solid obtained was filtered, washed by dry ether several times andthed fused with CaCl2.The pale. Dark yellow crystal separated out. The yield of product=0.35 gram.



Schiff base complex

Result and Discussion :-The IR spectra PEB1 and PEB2 hydrazone shows C-O absorption 1650-1670 $cm^{-1,}$ N-N absorption band 3100-3200cm^{-1},The C-O appears1000-1090cm^{-1} in complexes shows hydrazone ligand in deprotonation.1630-1500 cm^{-1}give C=N stretching and free ligand absorption at 1650cm^{-1} and 1670cm^{-1}.

H^1-NMR spectra –Benzoyl ring 1H triplet δ 7.32, 1H doublet δ 7.31,1H doublet at δ 7.75 1H doublet at δ 7.00 , singlet 3 H(methyl) at δ 2.35, singlet at δ 7.0 NH hydrazide, singlet at δ 0.9 for 3H in $CH_{3\&}$(α-substituent), δ 3.37 3H, 1H singlet δ 7.90,1H doublet δ 8.80,1H doublet at δ 7.50 shows trisubstituted pyridine.

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Conclusion –PEB1 and PEB2 schiff base hydrazone ligand shows better chelator for Fe^{3+} and Cr^{3+}ion in neutral medium as a hexadentate structure remarkable application in medical field.

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