

Preparation of New Ni (II) Complex from 1-(2,3-dimethylphenyl)- 3 phenylthiourea thiourea Derivative.

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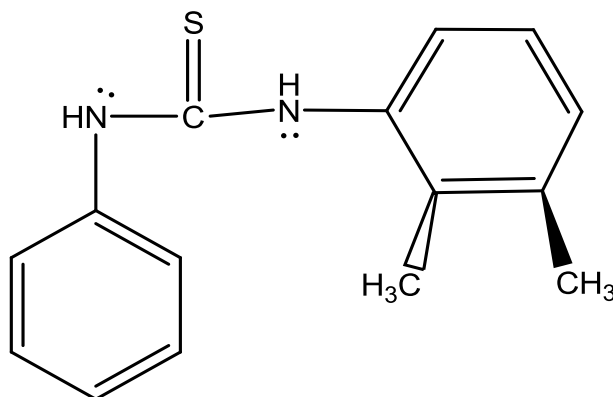
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Abstract

Thiourea derivative have been synthesized by reaction of phenyl isocyanate with derivative of aniline under specific condition to Give 1-(2,3-dimethylphenyl)- 3 phenylthiourea. Ni(II) complexes of these ligand were synthesized and characterized by their FTIR spectrum UV-Vis spectrophotometer .

الخلاصة :

يتناول هذا البحث تحضير مشتقا جديد لمركب ثايويوريا من تفاعل كل فنييل ايزوسيانات مع ١,٢ -ثنائي مثل أنلين لإنتاج ١- (٣,٢ داي مثل فنييل) -٣ فنييل ثايويوريا، وتم تحضير معقد جديد لهذا المشتق مع ايون النيكل (الثنائي) وتم تشخيصها باستخدام تقنية FT-IR وأطياف UV-Vis.



1-(2,3-dimethylphenyl)-3-phenylthiourea

Introduction

Interest in substituted thioureas as potential antimicrobial and antiviral agents has continued because this class of compounds demonstrated significant activity against different micro organisms (Galabov A.S. *et al* 1980) The important at insecticidal and acaricidal activities have also been reported for these compounds (Singh B.N. *et al* 1978). A large number of isocyanate substituted thioureas have also been synthesized and study the biological activity

(Sarkis *et al* ., 1985). It was found that thioureas , aniline and aniline derivatives from complexes with transition metal ions (Bagleg *et al* 2006; Monson 1971). A link between isocyanate and amines biological activity have been reported . The present communication describes the synthesis of some newer thioureas derivatives and their Ni(II) complexes , this complexes were characterized by their FT-IR spectra , UV-Visible spectrophotometer The following (1-(2,3-dimethyl phenyl)- 3 phenylthiourea substituted thioureas were prepared and studied (Peris, 2007).

Experimental

All chemicals of highest purity were used in this work which supplied by Fluka and BHD, Phenylisocyanate C_6H_5NCS , 2,3 dimethylaniline C_8H_9N and $NiCl_2$.

Apparatus and Materials

FT-IR spectra were recorded on a (FT-IR 84005 prestige -21), SHIMADZO , KBr Disk and UV-Vis recorded by (UV-165 Opc), SHAMDA .

• Preparation of Thiourea derivative:-

Thiourea derivative was synthesized by reaction 2,3 dimethyl-aniline with phenylisocyanate according to the reported procedure (Sarkis *et al.*, 1985, Peris, 2007).

• Preparation of complexes :-

The complexed was prepared by addition of solution of the metal salt $NiCl_2$ (0.01 mol) dissolved in DMSO (25ml) to solution of thiourea derivative (0.05 mol) in the same solvent (25 ml) , the complexes separated and filtered , washed with ether , dried in vacuum and recrystallized from ethyl acetate(Fahad *et al* , 2010, Vogel, 1965).

Result and discussion

The reaction of phenylisocyanate with 2,3 dimethyl aniline derivatives thiocyanate give the corresponding N-aniline substituted thiourea derivatives , the resulting thiourea was treated with Ni(II) chloride in DMSO, as a result complex was isolated, the metal:thiourea derivatives ratio in case was 1:2 the complex is insoluble into non-polar solvent; but it is soluble in dimethylsulphoxide , acetone , ethyl acetate (Monson R. S. 1971)..

UV-Vis spectrum

UV-Vis spectrum of Reagent thiourea derivative Fig2 showed presence absorption peak (276)nm this attribute to electronic transition ($\pi - \pi^*$) of (C=S) (C=C) of thio and benzene ring(Monson R. S. 1971., Vogel A.I. 1965).

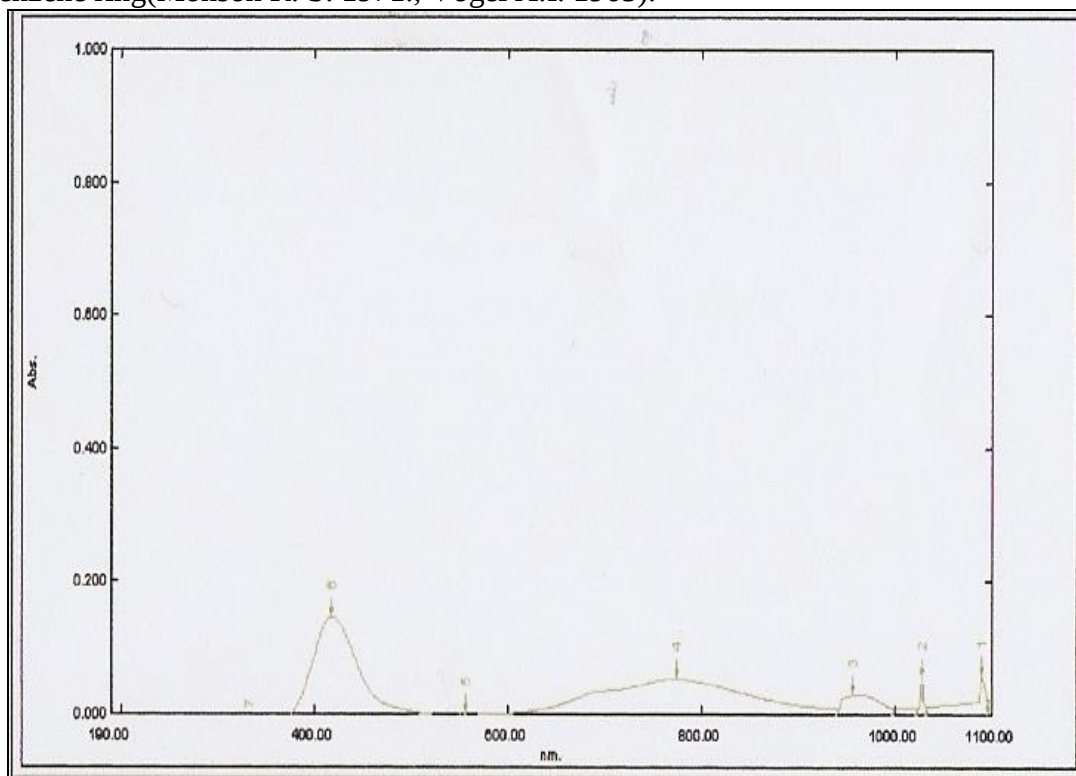


Fig (1) showed only metal of Ni (II)

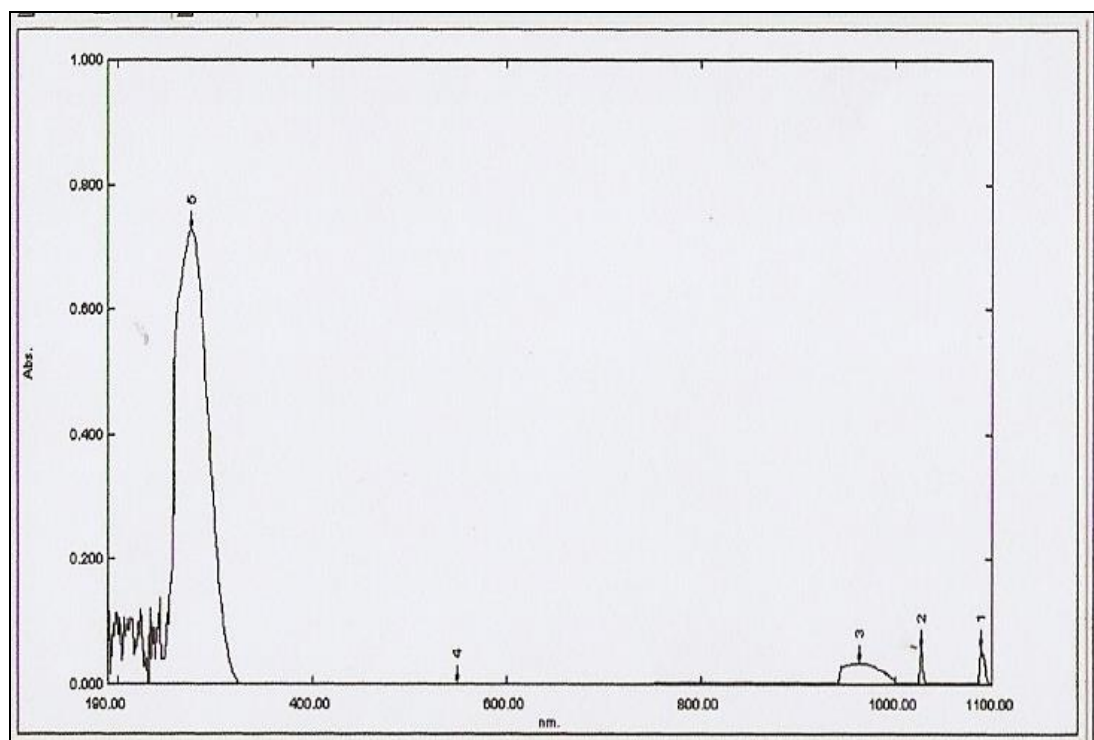


Fig (2) showed of Ligand (thiourea)

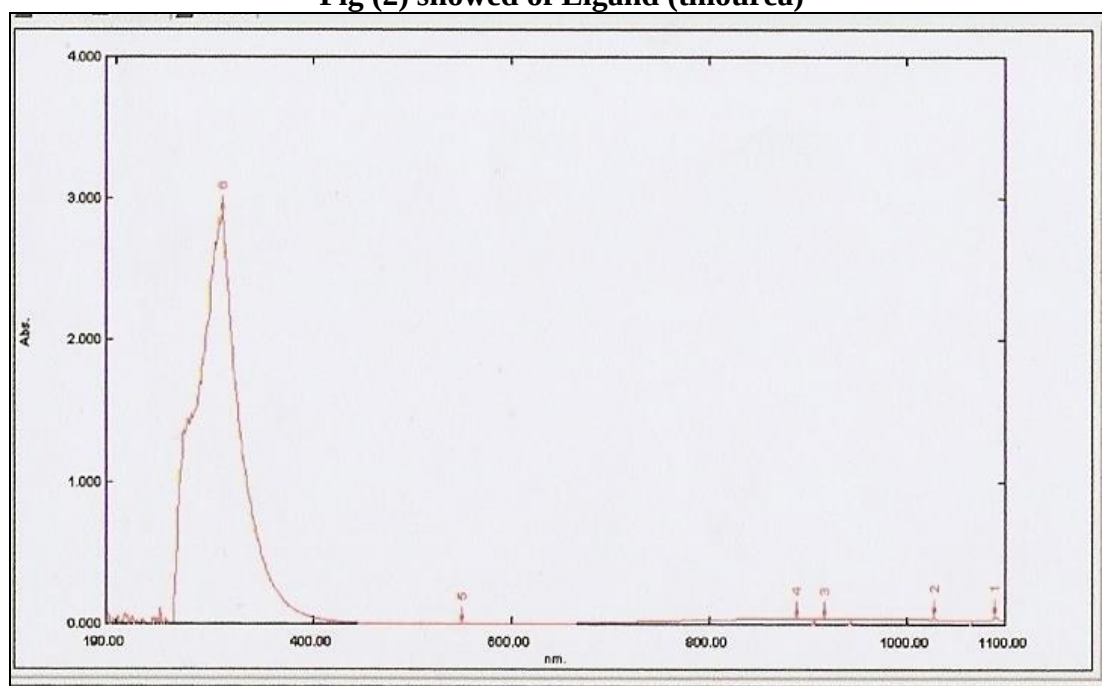


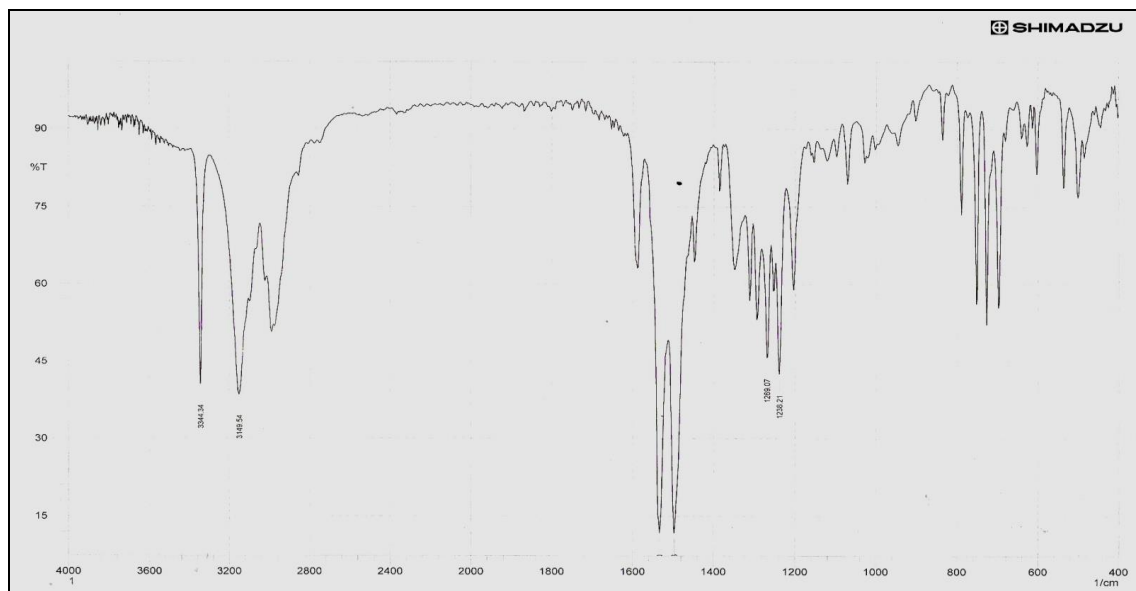
Fig (3) showed complex Ni(II)

While UV-Vis spectrum of Ni (II) complex with Ligand (thiourea derivative) (fig3) illustrated presence a new absorbance peak at (307)nm the red shift confirm the formation of complex (Jreou A.M., 2005). this attribute ($\pi - \pi^*$) of C=N . (Fig1) showed presence absorption on metal (774)nm and (417 nm).

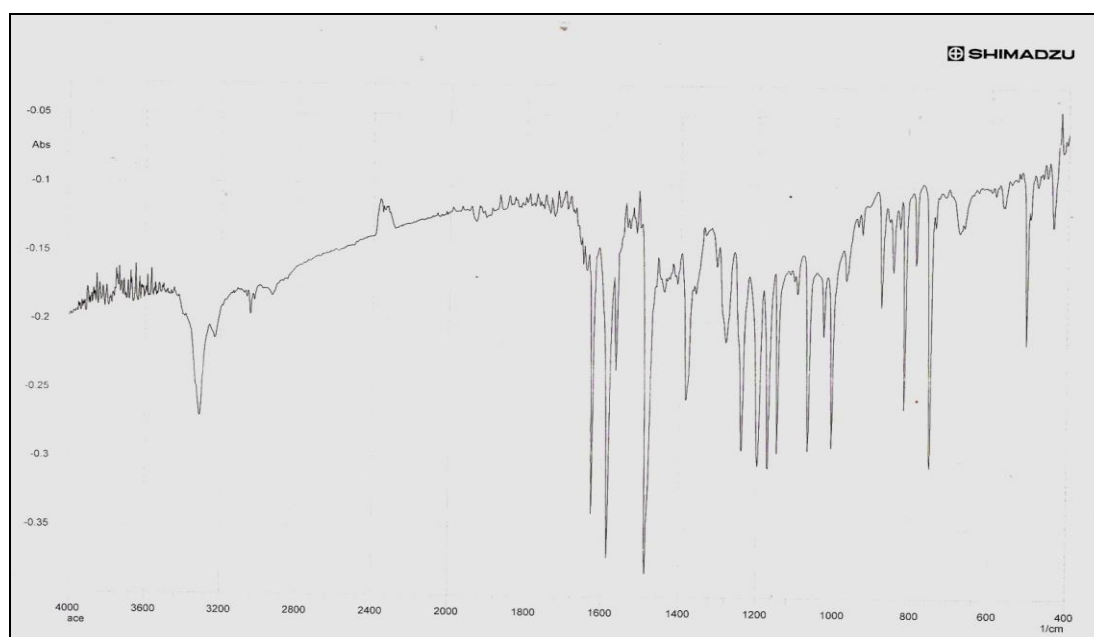
• **FT-IR spectra :-**

The Infrared spectrum of the complex (Fig4) show complex medium intensity in the 3301cm^{-1} to the NH(S) while in the (Fig5) the thiourea derivative the appear

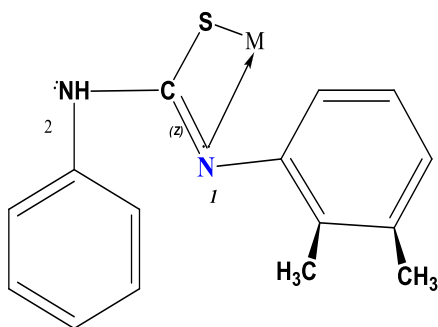
intensity two band 3149.59 cm^{-1} , 3344.34 cm^{-1} which are two the NH(S) these molecules contain different coordination; but one of band NH(S) was appear in complex because of one band (NH) were coordinated with metal(Kamoto K.N., 1963, Jreou A.M., 2005)



Fig(4) showed FTIR of Ligand (thiourea)



Fig(5) showed FTIR of complex Ni(II)

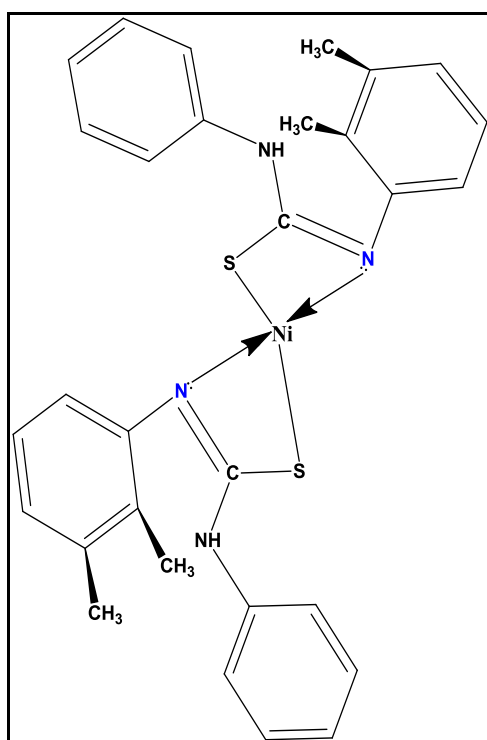


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The presence of phenyl group substituted on one of the nitrogen atom(1)(Forma1) in these thiourea derivative permits the coordination of transition metal ion to form stable natural complex because resonance between lone pair of nitrogen atom with phenyl group and found donating methyl group converse nitrogen atom(2) (The infrared absorption spectrum of the complexes showed band (N-H deformation + N-C-S Stretching) in ring ($1190-1290\text{ cm}^{-1}$), this band was splitted and increase in intensity(Kamoto K.N., 1963, Ward M.D., 2005).

The (C=C)and(C=N) stretching band at ($1595-1630\text{ cm}^{-1}$) appear as sharp, strong, it has been reported to phenyl ring and coordination with the metal, while infrared absorption if the ligand or thiourea derivative (fig4) showed(C=N) band not appear; but fig(5) showed (C=N) appear ($1501-1520\text{ cm}^{-1}$) as sharp and strong band. In absorbance spectra of thiourea appearing band at rang about ($710-820\text{ cm}^{-1}$) have been assigned to (C=S), (N-C-N) and (C=S) stretching; but the band of complex appearing as sharp in ($780-840\text{ cm}^{-1}$) (Kamoto K.N., 1963- Kahloul M.K., 2005).

Stricture suggestion of Ni(II) complex



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