

Reference

- Akbar, A.M., Dey, K.K., Nazimuddin, M., Smith,F.E., Butcher, R.J., Jasinski,J.P., and Jasinski,J.M. 1996. " The Preparation and Characterization of Some Copper (II) Complexes of the 6 - methyl - 2 - formylpyridine thiosemicarbazone and the X - ray Crystal Structure of the Dichloro(6-methyl-2-formylpyridinethiosemicabazonato) Copper(II) Complex ", Polyhedron 15(1996), 3331 - 3339.
- Akbar, A.M., Dey, K.K., Nazimuddin, M., Smith,F.E., Butcher, R.J., Jasinski,J.P., and Jasinski,J.M. 2001. " Synthesis , Characterization , Antifungal Properties and X - ray Crystal Structures of Five - and Six - coordinate Copper(II) Complexes of the 6 - methyl - 2 - formylpyridine *N* - dimethylthiosemicarbazone ", Polyhedron 20(2001), 1045 - 1052.
- Amma, E.L., Vranka, R.G. 1966. " Electron - Deficient Bonding Involving Sulfur Atoms. The Crystal Structure of Cu₄[SC(NH₂)₂]₉(NO₃)₄ ", J. Amer. Chem. Soc. (1966), 4270-4271.
- Atkinson, E.R., Gardineer, D.J., Jackson, A.R.W. and Raper, E.S. 1985. " Tris - (1-methylimidazoline-2(3H)-thione) Copper(I) Nitrate: Preparation, Thermal Analysis and Crystal Structure ", Inorg. Chim. Acta. 98(1985), 35 - 41.
- Battaglia, L.P., Corradi, A.B., Nardelli, M. and Tani, M.E.V. 1976. " X-ray Crystal Structures of Tetrakis(imidazolidine-2-thionato) copper (I) nitrate and Dichloro - μ - imidazolidine - 2 - thionato - tris(imidazolidine - 2 - thionato) dicopper(I)", J. C. S., Dalton Trans. , (1976),143-146.

Bott, R.C., Bowmaker, G.A., Davis, C.A., Hope, G.A. and Jones, B.E. 1998. "Crystal Structure of $[\text{Cu}_4(\text{tu})_7](\text{SO}_4)_2 \cdot \text{H}_2\text{O}$ and Vibrational Spectroscopic Studies of Some Copper(I) Thiourea Complexes". Inorg. Chem. 37(1998), 651-675.

Bowmaker, G.A., Pakawatchai, C., Skelton, B.W., Thavornyutikan, P., Wattanakanjana, Y. and White, A.H. 1994. "Vibrational Spectra and Crystal Structures of Tris- and Tetrakis(ethylenethiourea) Copper(I) Systems", Aust. J. Chem. 47 (1994), 15 -24.

Burdett, J.K., and Eisenstein, O. 1992. "From Three - to Four - Coordination in Copper(I) and Silver(I)", Inorg. Chem. 31(1992), 1758-1762.

Bret, J.M. 1983. "Nuclear Quadrupole Resonance of Several Copper(I) Complexes with Heterocyclic Thioamido Ligands. Crystal structure of Chlorobis [tetrahydro-1H-pyrimidine-2-thione]copper(I)", J. C. S. Dalton. Trans. (1983), 301 - 304.

Brown, D.A. 1988. Comparative Inorganic Chemistry. England ; Mc GRAW - Hill.

Caira, M.R., and Nassimbeni, L.R. 1974. "Crystal and Molecular Structure of catena-[Dichloro(8-mercaptopurine)-copper(I)]", J. C. S. Dalton. Trans. (1974), 4 - 6.

Cernak, J., Chomic, J., Kutschy, P., Svcinova, D. and Dzurilla, M. 1991. "Preparation and Characterization of the Complexes $\text{Cu}(\text{PTU})_2\text{Cl}$, $\text{Cu}(\text{ETU})_2\text{Cl}$ and $\text{Cu}(\text{BTU})_2\text{Cl}$ ($\text{PTU} : \text{R} = \text{phenyl}$, $\text{ETU} : \text{R} = \text{ethyl}$, $\text{BTU} : \text{R} = \text{benzyl}$ in $\text{CH}_3\text{CH} = \text{CH} - \text{CO} - \text{NH} - \text{CS} - \text{NH} - \text{R}$) ; crystal structure of the $\text{Cu}(\text{PTU})_2\text{Cl}$ complex", Inorg. Chim. Acta. 181(1991), 85 - 92.

Clegg, W. 1998. Crystal Structure Determination. New York : Oxford University Press.

Cotton, F.A. and Wilkinson, G. 1988. Advanced Inorganic Chemistry. 5th ed. New York ; John Wiley & Sons.

Creighton, J.R., Gardiner, D.J., Gorvin, A.C., Gutteridge, C., Jackson, A.R.W., Raper, E.S. and Sherwood, P.M.A. 1985. "Copper(I) Halide Complexes of Imidazole Thiones : Crystal Structures of Dimeric Monochloro bis(1-methylimidazoline-2-thione) Copper(I)", Inorg. Chim. Acta. 103(1985), 195-205.

Crumbliss, A.L., Gestaul, L.J., Rickard, R.C. and Mephail, A.T. 1974. "Preparation and X - Ray Crystal Structure of a Novel Tetranuclear Copper(I) Ethylenethioure Cluster Complex, - μ_4 -Ethylenethiourea - cyclo - tetraki - μ - (ethylenethiourea) tetrakis[ethylenethioureacopper(I)] Nitrate Hexahydrate", J. C. S., Chem. Comm. (1974), 545 - 546.

Doona, C.J. and Stanbury, D.M. 1996. "Equilibrium and Redox Kinetics of Copper (II) - Thiourea Complexes ", Inorg. Chem. 35(1996), 3210 - 3216.

Dubler, E. and Bensch, W. 1986. "Cu (*N,N* - dimethylthiourea)₂NO₃ a Copper(I) Complex Exhibiting Infinite Chains of Edge - sharing CuS₄ Tetrahedra ", Inorg. Chim. Acta. 125(1986), 37 - 42.

Eller, P., and Corfield, P.W.R. 1971. "The Crystal Structure of a Trigonal Planar Copper(I) Complex ", J. C. S., Chem. Comm. 19(1971), 105 - 106.

Ferrari, M.B. Fava, G.G., Lanfranchi, M., Pelizzi, C. and Tarasconi,P. 1991. "Synthesis, spectroscopic and structural characterization of chlorobis(methyl) pyruvate

thiosemicarbazone) copper(I) and chlorobis(triphenylphosphine) (methyl pyruvate thiosemicarbazone) copper(I) toluene solvate" Inorg. Chim. Acta. 181 (1991) 253-262.

Ferrari, M.B., Capacchi, S., Pelosi, G., Reffo, G., Tarasconi, P., Albertini, R., Pinelli, S. and Lunghi, P. 1999. " Synthesis, Structural, Characterization and Biological Activity of Helicin Thiosemicarbazone monohydrate and a Copper(II) Complex of Salicylaldehyde Thiosemicarbazone ", Inorg. Chim. Acta. 286(1999), 134 - 141.

Filinchuk, Y.E., Oliinik, V.V., Glovyak, T. and Mys'kiv, M.G. 2001. " Thiourea *N*- and *S* - Derivatives as Ligands : Synthesis and Crystal Structure of $4\text{CuCl}\cdot6\text{All-NHCSNH}_2$ and $[(\text{All-NH})_2\text{C-SC}_2\text{H}_5]\text{Cu}_2\text{Cl}_x\text{Br}_{3-x}$ ($X=0.765$, All is Allyl) ", Russ. J. Coord. Chem. 27, 126 - 134.

Frost, J.G. Lawson, M.B. and Mcpherson, W.G. 1976. " Nature and Cumulative Stability Constants of Copper(I) Complexes of Some Substituted Thioureas ", Inorg. Chem. 15(1976), 940 - 943.

Gash, A.G., Griffith, E.H., Spofford, W.A. and Amma, E.L. 1973. "A Six - membered Cu_3S_3 Ring in Decakis(thiourea) tetracopper(I) Hexafluorosilicate Monohydrate. X- ray Crystallographic Structure Determination". J. C. S. Chem. Comm. (1973), 256-257.

Girling, R.L. and Amma, E.L. 1971. "The Crystal and Molecular Structures of Chlorotris(*N,N*- dimethylthiourea) copper(I) ", Inorg. Chem. 10(1971), 335 - 340.

Griffith, E.H., Hunt G.W. and Amma, E.L. 1976. "The Adamantane Structure in Polynuclear Cu₄S₆ Cores : The Crystal and Molecular Structures of Cu₄[SC(NH₂)₂]₆(NO₃)₄·4H₂O and Cu₄[SC(NH₂)₂]₉(NO₃)₄·4H₂O", J. C. S. Chem. Comm., (1976), 432 - 433.

Griffith, E.A.H., Spofford, W.A. and Amma, E.L. 1978. "Crystal and Molecular Structure of a Colored Intermediate from the Reaction of Tetramethylthiourea and Copper(2+) (Dichlorobis(tetramethylthiourea) copper(II)) ", Inorg. Chem. 17(1978), 1913 - 1917.

Hall, S.R., Flack, H.D., Stewart, J.M. 1992. Xtal 3.2 User's Manual. University of Western Australia. Lamb, Perth.

Hahn, T. 1983. International Tables for Crystallography (Volume A space - group symmetry). Boston : D. Reidel Publishing company.

Hanic, F. and Durcanska, E. 1969. "The Crystal Structure of Tris(thiourea) copper (I) perchlorate Cu(SCN₂H₄)₃ClO₄", Inorg. Chim. Acta, (1969), 293 - 298.

Kamara, R., Declereq, J.P., Germain, G. and Meerssche, M.V. 1982. "Structure of Complexes Copper(I) Thiourea Cu(SCN₂H₄)₃·½ SO₄", Bull. Soc. Chim. Belg. 91(1982), 339 - 340.

Kitagawa, S., Nozaka, Y., Munakata, M., and Kawata, M.V. 1992. "Synthesis and crystal structures of tetra - and hexanuclear copper complexes of pyrimidine derivatives, [Cu₄(C₄H₈N₂S)₄](ClO₄)₄ and [Cu₆(C₅H₅N₂S)₆] ", Inorg. Chim. Acta, 197(1992), 169 - 175.

Kunchur, N.R. and Truter, M.R. 1958. "A detailed Refinement of the Crystal and Molecular Structure of Thiourea", Crystal and Molecular Structure of Thiourea, (1958) 2552-2557.

Lane, T.J., Yamaguchi, A.Y., Quagliano, J.V., Ryan, J.A. and Mizushima, S. 1959. "Infrared Absorption Spectra of Inorganic Coordination Complexes. Infrared studies of Methylthiourea and its Metal Complexes", J. C. S. Dalton. Trans. (1959), 3824-3826.

Massa, W. 2000. Crystal Structure Determination. 2nd ed., New York : Springer - Verlag Berlin Heidelberg.

Mishra, L. and Pandey, A.K. 1992. " Spectroscopic, Electrochemical and Antifungal Studies of Transition Metal Complexes with Macrocycles Containing Nitrogen and Sulphur Donor Atoms ", Polyhedron 11(1992), 423 - 430.

Parker, S.P. 1993. Encyclopedia of Chemistry. 2nd ed., Ohio : McGraw. Hill Book company.

Plesch, G., Friebel, C., Svajlenvaj, O. and Smogrovi, K. 1995. " Coordination Geometries and Cooperative Ordering Effects in Copper(II) Complexes with Tridentate Schiff Base Dianions. EPR Study on N- Salicylideneglycinatacopper (II) Complexes with Thiourea Derivatives ", Polyhedron 14(1995), 1185 - 1193.

Raymond, C.B., Graham, A.B., Carol, A.D., Gregory, A.H. and Brain, E.J. 1998. "Crystal Structure of $[Cu_4(tu)_7(SO_4)_2] \cdot H_2O$ and Vibrational Spectroscopic Studies of Some Copper(I) Thiourea Complexes ", Inorg. Chem. 37(1998), 651 - 657.

- Raper, E.S., Creighton, J.R., Robson, D., Wilson, J.D., Clegg, W., and Milne, A. 1988. “ Tetrakis(1-methylimidazoline-2-thione)- μ_2 -bis(1- methylimidazoline-2- thione) -di-copper(I) Tetrafluoroborate : Preparation, Thermal Analysis and Crystal Structure ”, Inorg. Chim. Acta, 143(1988), 95 - 100.
- Raper, E.S., Creighton, J.R. and Wilson, J.D. 1989. “ Polymeric Cyano(1- methylimidazoline-2-thione)copper(I), $[Cu(mimtH)CN]_n$: Preparation, Spectroscopy, Thermal Analysis and Crystal Structure”, Inorg. Chim. Acta, 155(1989), 77 - 83.
- Raper, E.S., Creighton, J.R., Wilson, J.D., Clegg, W., and Milne, A. 1989. “ Bis(imidazolidine-2-thione)(thiocyanato-*N*) copper(I) : preparation, Thermal Analysis and Crystal Structure”, Inorg. Chim. Acta, 155(1989), 85 - 89.
- Raper, E.S., Wilson, J.D. and Clegg, W. 1992. “ [Bis{bis(imidazolidine-2-thione)- μ_2 -(imidazolidine-2-thione)copper(I)}] diperchlorate : Synthesis and Crystal Structure”, Inorg. Chim. Acta, 194(1992), 51 - 55.
- Shen, X., Wen, T., Liu, Q., Huang, X., Kang, B., Wu, X., Huang, Z. and Gu, L. 1997. “ Synthesis and Crystal Structures of Copper(I) Complexes with Alkyl - thioallophanate Derivatives ”, Polyhedron 16(1997), 2605 - 2611.
- Shen, X., Xianta, S., Beisheng, K., Yexiang, T.Y.L., Lianquan, G., Qiutian, L. and Yaoying, H. 1998. “ Preparation and Crystal Structure of a New Cu(II) Complex Derived from the Desulfurization of *N*-(*p*-nitrophenyl)-*N*-ethoxycarbonyl-thiourea ”, Polyhedron 17(1998), 1 - 5.

Singh, R. and Dikshit, S.K. 1992. "Synthesis and Characteristic of Mixed Ligand Copper(I) Complexes Containing Halides, Triphynylarsine and *N,N*-Dimethyl-*N*-phenylthiourea (dmptH), *N,N*-Dibutyl-*N*-phenylthiourea(dbptH), or 1,3-Thiazolidine-2-thione (tzdtH). The X - ray Crystal Structure of [Cu(PPh₃)₂ (dmptH)Cl]", Polyhedron 14(1995), 1799 - 1807.

Spofford, W.A., and Amma, E.L. 1968. "Trigonal Planar Copper(I) and Electron Deficient Bridge Bonds in Bis(thiourea) copper(I) Chloride ", J. C. S., Chem. Commun. (1968), 405 - 407.

Stocker, F.B., Troester, M.A. and Britton, D. 1996. "Crystal Structures of a Family of New Copper(I) Cyanide Complexes of Thiourea and Substituted Thioureas", Inorg. Chem. 35(1996), 3145 - 3153.

Sybil, P.P. 1993. Encyclopedia of Chemistry. New York : McGraw. Hill Book Company.

Taylor, I.F., Weining, W.S. and Amma, E.L. 1974. "Preparation, Crystal Structure, and Bonding of the Dimers of the Dimers of Tris(thiourea) copper(I) Tetrafluoroborate and Tris(S-dimethylthiourea) copper(I) Tetrafluoroborate ", Inorg. Chem. 13(1974), 2835-3842.

Vizzini, E.A., taylor, I.F. and Amma, E.L. 1968. "Electron - Deficient Bonding with Sulfur Atoms. Crystal and Molecular Structure of Bis(thiourea) silver(I) Chloride", Inorg. Chem. 7(1968), 1351-1357.

Vranka, R.G. and Amma, E.L., 1996. "Electron - Deficient Bonding Involving Sulfur Atoms. The Crystal Structure of $\text{Cu}_4[\text{SC}(\text{NH}_2)_2]_9(\text{NO}_3)_4$ ", J. Am. Chem. Soc. 118(1996), 4270-4271.

Weininger, M.S., Hunt, G.W. and Ammma, E.L. 1972. "Crystal and Molecular Structures of Tris(ethylenethiourea) copper(I) sulphate and Tris(tetramethyl thiourea) copper(I) tetrafluoroborate [Examples of trigonal Planar Copper(I) Stereochemistry]", J. C. S., Chem. Commun. (1972), 1140 - 1141.

Yuan, Y.F., Wang, J.T., Gimeno, M.C., Laguna, A. and Jones, P.G. 2001. "Synthesis and Characterisation of Copper Complexes with N-ferrocenoyl-N'-aryl (alkyl)thioureas" Inorg. Chim. Acta. 324, 309-317.

Yamaguchi, A., Penland, R.B., Mizushima, S., Lane, T.J., Curran, C. and Quagliano, J.V. 1958. "Infrared Absorption Spectra of Inorganic Coordination Complexes. Infrared Studies of Some Metal Thiourea Complexes", Spectra of Metal Thioureas Complexes, (1958), 527-529.