

# Synthesis, characterization and antioxidant activity of novel copper complexes with organosulfur ligands

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The use of edible oils in the presence of high temperatures and oxidizing atmospheres produces free radicals, which are harmful if ingested. Although, antioxidants can interrupt or drastically reduce the formation of these radical. The application of synthetic antioxidants has shown carcinogenic potential damage; however, researches prove that garlic has a high potential in reducing free radicals. There is evidence that S-alkenyl sulfoxide class compounds are responsible for the activity in this case, especially allin<sup>1</sup>.

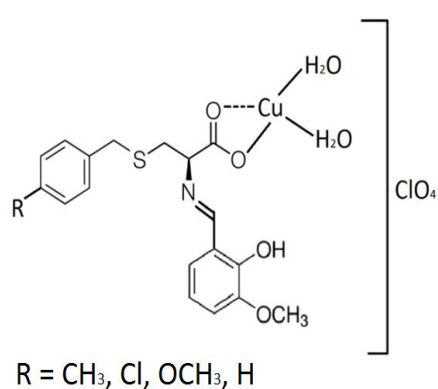


Figure 1: Complex's general structure

In this study, four new complexes were synthesized from copper perchlorate, which, in turn, was derived from allin ligands. The complexes were produced through the S-alkylation of L-cysteine with 4-chlorobenzyl chloride, 4-methylbenzyl chloride, 4-methoxybenzyl chloride and benzyl chloride<sup>2</sup>. The condensation reaction of the ligands previously mentioned with *o*-vanillin formed the imine.

Elemental analysis, NMR, and Infrared Spectroscopy confirmed the structures.

Moreover, the DPPH test evaluated the effectiveness of each complex in capturing free radicals as can be seen in Table 1.

Table 1: Complex's half maximal inhibitory concentration (IC<sub>50</sub>)

Complex	CompImLigMe	CompImLigCl	CompImLigMeO	CompImLigBz
IC 50 (mol/L)	1,1*10 <sup>-4</sup>	2,0*10 <sup>-5</sup>	9,1*10 <sup>-6</sup>	4,1*10 <sup>-4</sup>

[DPPH] = 9,6\*10<sup>-5</sup> mol/L

The antioxidant potential of all complexes was confirmed; nonetheless, the complex with methoxy radical showed a better outcome in comparison to the others complexes. Those complexes with chlorine and methoxy radical presented better antioxidizing potential than the commercial antioxidant, BHT (IC<sub>50</sub>=1,25\*10<sup>-4</sup>).

1. Stoll, A.; Seebeck, E.; *Helv. Chim. Acta.* **1949**, 32, 876.

2. Freeman, G.G., Whenham, R.J.; *J.Sci. Food Agri.* **1975**, 26, 1869.

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