

## Documents

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**Synthesis, Characterisation, and Antimicrobial Activities of S-Benzyl- $\beta$ -N-3-methoxybenzoyl Dithiocarbazate (SB3OME) and its Metal Complexes**

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**Abstract**

A new substituted dithiocarbazate derivative ligand, S-benzyl- $\beta$ -N-3-methoxybenzoyl dithiocarbazate (SB3OME) has been prepared via the nucleophilic substitution reaction of Sbenzyldithiocarbazate with meta-methoxybenzoyl chloride. A series of complexes of SB3OME with Cu(II), Zn(II), Co(II), and Ni(II) were also synthesised. These complexes have a general formula of  $[M(SB3OME)_2]$ , where M represents Cu<sup>2+</sup>, Zn<sup>2+</sup>, Co<sup>2+</sup>, and Ni<sup>2+</sup>. All the synthesised compounds were characterised using various physico-chemical techniques. It was found that all complexes exhibited a six-coordinate where SB3OME acts as a uninegatively charged tridentate NOS ligand, resulting in an octahedral geometry. The antimicrobial activities of all compounds against *Staphylococcus aureus* (ATCC 25923), *Bacillus cereus* (ATCC 11778), *Pseudomonas aeruginosa* (ATCC 27853), *Escherichia coli* (ATCC 25922) were evaluated. The values of minimum inhibitory concentration (MIC) were obtained in reference to gentamycin as the standard drug. MIC assay shows that Cu(SB3OME)<sub>2</sub> is the most active compound with a MIC value of 437 ug/ml against *Staphylococcus aureus* (ATCC 25923) and *Pseudomonas aeruginosa* (ATCC 27853). This study concludes that the antimicrobial activities will enhance upon coordination with metal ions, and the metal complexes can be considered for further development as potential antibiotics. © 2024 Malaysian Institute of Chemistry. All rights reserved.

**Author Keywords**

antimicrobial; Dithiocarbazate derivatives; metal complexes; minimum inhibitory concentration; tridentate

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