ABSTRACT

Nine Zn(II) complexes were prepared and characterized. The synthesis was started by preparation of zinc ibuprofen \([\text{Zn}_2\text{Ibup}_2]\) 1, after that, different nitrogen-donor ligands were reacted with complex 1 to produce the target complexes. The complexes were \([\text{Zn}(\text{ibup})_2(2\text{-ampy})_2]\) 2, \([\text{Zn}(\text{ibup})_2(2\text{-ammethylpy})_2]\) 3, \([\text{Zn}(\text{ibup})_2(2,2\text{-bipy})]\) 4, \([\text{Zn}(\text{ibup})_2(4,4\text{-bipy})]\) 5, \([\text{Zn}(\text{ibup})_2(1,10\text{-phen})]\) 6, \([\text{Zn}(\text{ibup})_2(2,9\text{-dmphen})]\) 7, \([\text{Zn}(\text{ibup})_2(1,2\text{-dmimidazole})_2]\) 8 and \([\text{Zn}(\text{ibup})_2(2\text{-am-6-picoline})_2]\) 9. IR, \(^1\text{H}\) NMR, \(^{13}\text{C}\{^1\text{H}\}\) NMR and UV-Vis spectrophotometric techniques were used for characterization. The crystal structures of complexes 2 and 5 were determined by single-crystal X-ray diffraction. The investigation of in-vitro anti-bacterial activity for the prepared complexes against Gram-positive (Micrococcus luteus, Staphylococcus aureus and Bacillus subtilis) and Gram-negative (Escherichia coli, Klebsiella pneumoniae and Proteus mirabilis) bacteria was done using agar well-diffusion method. Complexes 1 and 5 showed anti-bacterial activity against G-positive bacteria. Complexes 2, 3, 8 and 9 did not exhibit any anti-bacterial activity.

Complexes 4, 6 and 7 showed anti-bacterial activity and were chosen for further studies to determine IZD for different concentrations of each one and to set the MIC for each complex. The complexation of zinc-ibuprofen with 2,2'-bipy and 1,10-phen in complexes 4 and 6, respectively decreased the anti-bacterial activity against most of the bacteria used. The complexation in 7 decreased the anti-bacterial activity in Gram-positive bacteria but in case of Gram-negative, the overall anti-bacterial activity of uncoordinated 2,9-dmphen was enhanced on coordination with zinc ibuprofen.