ABSTRACT

Nine Zn(II) complexes were prepared and characterized. The synthesis was started by preparation of zinc ibuprofen $[Zn_2(ibup)_4]$ **1**, after that, different nitrogen-donor ligands were reacted with complex **1** to produce the target complexes. The complexes were $[Zn(ibup)_2(2\text{-ampy})_2]$ **2**, $[Zn(ibup)_2(2\text{-ammethylpy})_2]$ **3**, $[Zn(ibup)_2(2,2`\text{-bipy})]$ **4**, $[Zn(ibup)_2(4,4`\text{-bipy})]_n$ **5**, $[Zn(ibup)_2(1,10\text{-phen})]$ **6**, $[Zn(ibup)_2(2,9\text{-dmphen})]$ **7**, $[Zn(ibup)_2(1,2\text{-dmimidazole})_2]$ **8** and $[Zn(ibup)_2(2\text{-am-6-picoline})_2]$ **9**. IR, ^{1}H NMR, $^{13}C\{^1H\}$ 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.