ABSTRACT

In this present work eleven novel Zn(II) complexes $[Zn_2(nap)_4]$ **(1)**, $[Zn(nap)_2$1,10-phen] **(2)** $[Zn(nap)_2$2,9-dmphen] **(3)**, $[Zn(nap)_2$2,2-bipy] **(4)**, $[Zn(nap)_2(2\text{-ampy})_2]$ **(5)**, $[Zn_2(nap)_4(4\text{-pic})_2]$ **(6)**, $[Zn(nap)_2$4,4-bipy$]_n$ **(7)**, $[Zn_2(nap)_4(quin)_2]$ **(8)**, $[Zn(nap)_2(imid)_2]$ **(9)**, $[Zn(nap)_2(1,2\text{-dmimid})_2]$ **(10)**, $[Zn(nap)_2(pyrazole)_2]$ **(11)** were synthesized and characterized by IR, UV-Vis, ^{1}H NMR, ^{13}C{^{1}H} NMR spectroscopy. X-ray crystallography for complex **3** was also determined. In order to assess the effect of the metal ions on the anti-bacterial activity, the ligands and their complexes **1-11** have been screened *in-vitro*, against Gram positive, (G^+) bacteria (*Staphylococcus aureus* and *Micrococcus luteus)* and Gram negative, (G^-) bacteria *(Klebsiella pneumoniae, Pseudomonas aeruginosa, Proteus mirabilis and Escherichia coli)* using the agar well diffusion method. All complexes exhibit anti-bacterial activity against the tested bacterial species except complex **8**. Due to the higher anti-bacterial activity of complexes **2, 3**, **5** they were chosen and tested with their parent nitrogen donor ligands to determine the effect of the complexation on the anti-bacterial activity. Complex **2** showed lower anti-bacterial activity against the tested bacterial species than the 1,10-phenanthroline ligand, so in this complex the anti-bacterial activity decreased due to complexation. Complex **3** showed higher anti-bacterial activity against G^- bacteria than its parent ligand, 2,9-dimethyl-1,10-phenanthroline, but this ligand showed higher anti-bacterial activity against G^+ than complex **3**. Complex **5** showed anti-bacterial activity only against G^+, and 2-amino pyridine ligand did not show anti-bacterial activity against the tested bacterial species.