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**Solvent assisted synthesis, structural characterization and biological evaluation of cobalt(II) and nickel(II) complexes of Schiff bases generated from benzyl carbazate and cyclic ketones**

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**Abstract**

A series of mononuclear cobalt and nickel complexes of the types  $[M(NCS)_2(L1)_2]$ ,  $M = Co$  **1** or  $Ni$  **2**,  $[M(NCS)_2(L2)_2].nH_2O$ ,  $M = Co$  ( $n=0$ ) **3** or  $Ni$  ( $n=2$ ) **4** and  $[M(NCS)_2(L3)_2]$ ,  $M=Co$  **5** or  $Ni$  **6**, where  $L1=benzyl$  2-(cyclobutanylidene)hydrazinecarboxylate,  $L2=benzyl$  2-(cyclopentanylidene)hydrazinecarboxylate and  $L3=benzyl$  2-(cyclohexanylidene)hydrazinecarboxylate, were synthesized by template reactions of the metal nitrates, ammonium thiocyanate and benzyl carbazate (**bc**) with cyclobutanone (**cb**), cyclopentanone (**cp**) or cyclohexanone (**ch**). These compounds have been characterized by elemental analysis, infrared, electronic absorption and <sup>1</sup>H NMR spectroscopies, together with single crystal X-ray diffraction. Crystal structures of the complexes **1**, **3-6** showed that the Schiff base ligands coordinate to the metal ions *via* the azomethine nitrogen and carbonyl oxygen atoms. In each case the two thiocyanate ligands coordinate through their nitrogen atoms resulting in complexes with a six coordinate octahedral geometry. The thermal stability of the complexes was investigated by TG-DTA and all of the compounds (**1-6**) undergo endothermic followed by exothermic decomposition processes to form the respective metal oxides. The antibacterial

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