

**MS30-P12** Novel complexes of copper(II) with  $[\text{MnCl}_4]^{2-}$  anionJuraj Kuchár<sup>1</sup>, Erika Samořová<sup>1</sup><sup>1</sup>. Institute of Chemistry, Department of Inorganic Chemistry, P. J. Šafárik University in Košice, Košice, Slovakia

email: juraj.kuchar@upjs.sk

At present, hydrogen bonding mediated magnetism is a well-documented phenomenon [1] and the results of magnetic studies have shown that the exchange parameter  $J$  can reach as high values as 38.3 K [2]. The study of magnetic and thermodynamic properties of structurally 1D compound  $\text{Cu}(\text{en})_2\text{Ni}(\text{CN})_4$  ( $\text{en} = 1,2$ -diaminoethane) in the very low temperature region (below 0.5 K) corroborated its magnetically 2D character; as additional exchange paths to the covalent bonds the present HBs of the N-H...N type were suggested. The character of the magnetic exchange interactions is very weak and is in line with long exchange path through the diamagnetic -NC-M-CN- five-atomic bridge. In order to shorten this five-atomic bridge we have undertaken a study of a series copper(II) compounds in which  $[\text{M}(\text{CN})_4]^{2-}$  bridging species were replaced by  $[\text{MnCl}_4]^{2-}$  anion. The use of this anion as a bridging unit enhances the attractiveness of these Cu(II)-Mn(II) bimetallic chain systems from magnetic properties point of view. The use of ethylenediamine's methyl derivatives lead to structurally similar 1D compounds as it was in the case of  $\text{Cu}(\text{en})_2\text{Ni}(\text{CN})_4$ , in which copper(II) atoms are linked by anion species. Surprisingly the use of the macrocyclic ligand *cyclam* (*cyclam* = 1,4,8,11-tetraazacyclotetradecane) led to different structural arrangement and the crystal structure analysis reveal 3D character of the structure, where besides the expected chains of -Cu-Cl-Mn-Cl-Cu- type another chain of -Mn-Cl-Mn-Cl-Mn- type that connecting them appeared. In order to investigate this phenomena we have prepared and characterized several new derivatives of the *cyclam* and used them for preparation of new complexes. The results of the crystal structure determination have shown formation of 1D chains; the hexa-coordinated Cu(II) atoms are surrounded by one molecule of blocking ligands and two chlorine atoms in *trans* position linking Cu(II) atoms with Mn(II) atoms as it was in above mentioned compounds. Further details of the synthesis, characterization and molecular and crystal structures of all compounds will be given.

This work was supported by the Slovak grant agency APVV under contract Nos. APVV-0132-11 and by grant agency VEGA (grant 1/0075/13).

[1] Costa J.S., Bandeira N.A.G., Guennic B.L., Robert V., Gamez P., Chastanet G., Ortiz-Frade L., Gasque L., *Inorg. Chem.* 50 (2011) 5696–5705. [2] Baran P., Boča R., Breza M., Elias H., Fuess H., Jorík V., Klement R., Svoboda I., *Polyhedron*, 21 (2002) 1561-1571.

**Keywords:** hydrogen bonds, copper and manganese compounds

**MS30-P13** Crystallographic analysis of iridium(I) N-heterocyclic carbene complexes of benzimidazol-2-ylideneMerve İzmirli<sup>1</sup>, Aytaç G. Gökçe<sup>1</sup>, Süleyman Gülcemal<sup>2</sup>, Muhittin Aygün<sup>1</sup><sup>1</sup>. Department of Physics, Dokuz Eylül University, 35160 Buca, İzmir, Turkey.<sup>2</sup>. Department of Chemistry, Ege University, 35100 Bornova, İzmir, Turkey

email: izmirlierve@yahoo.com

The transition metal complexes of N-heterocyclic carbenes (NHCs) based on imidazol, imidazolin and benzimidazole framework have been the focus of intense research in organometallic chemistry and homogeneous catalysis.<sup>1-4</sup> The crystal and molecular structures of Ir(I) NHC complexes have been determined by single crystal x-ray diffraction technique. In both complexes, iridium atoms lie in a slightly distorted square-planar coordination environments defined by the coordination of the metal to the two olefinic bonds of the cyclooctadiene ligand, the carbon atom of the NHC ligand and the chlorine atom (Figure 1). The iridium–NHC bond lengths agreed (COD) well with the values found in other NHC-supported [Ir(COD)Cl] complexes.

<sup>1</sup> N-heterocyclic carbenes: From laboratory curiosities to efficient synthetic tools, ed. S. Díez-González, RSC Catalysis Series No. 6, Royal Society of Chemistry, Cambridge, 2011.

<sup>2</sup> F.E. Hahn and M.C. Jahnke, *Angew. Chem., Int. Ed.*, 2008, 47, 3122.

<sup>3</sup> W.A. Herrmann, *Angew. Chem., Int. Ed.*, 2002, 41, 1290.

<sup>4</sup> K.J. Cavell and D.S. McGuinness, *Coord. Chem. Rev.*, 2004, 248, 671.