Polymeric chain complexes of copper(II) chloride with *N*-substituted tetrazoles: Structure and magnetic properties

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Low-dimensional magnetic compounds are of interest as models for high-temperature superconductors. In this connection, a number of 1D copper(II) coordination polymers were synthesized and their magnetic properties were studied. Chloride ions are suitable bridging ligands for the design of such polymers, since these ions can provide superexchange pathway between the metal cations. Elucidation of correlations between the structure and magnetic properties of complexes is an urgent task of magnetochemical studies.

N-Substituted tetrazoles demonstrate wide variety of structural types of cupric chloride complexes. So, ligands **L^1-L^5** were found to generate polymeric chain complexes **I-VI** (Fig.). In all complexes tetrazole rings are monocoordinated *via* N^4 atom, except **III** (N^3,N^4-bridging mode) and **IV** (N^3-monodentate mode). In **V** ligand L^4 shows chelating N^4,N^{amine}-coordination. Complexes **I** and **II** exhibit very weak ferromagnetic intrachain interactions [1], whereas **III–V** [2] and **VI** reveal antiferromagnetic ones. The strongest interactions with J = –17.6 cm^{-1} were observed for complex **III** in which metal cations are also linked by N^3–N^4 bridge. Complexes **IV**, **V** and **VI** have J value of –5.4, –14.2, and –1 cm^{-1}, respectively.

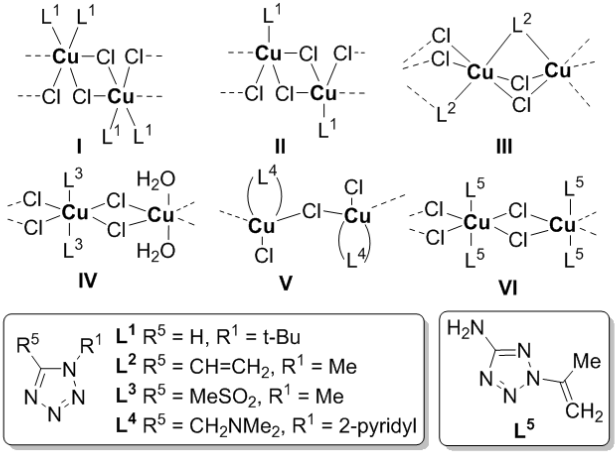

Fig. Structures of copper(II) chloride complexes with N-substituted tetrazoles

References

[1] S.V. Voitekhovich et al. Z. Anorg. Allg. Chem. (2020) 646: 1331
[2] S.V. Voitekhovich et al. Polyhedron (2021) 194: 114907