Synthesis, characterization and aggregation properties of a Zinc(II) salen Schiff-Base complex derived from 1,2-cycloexanediamine

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ABSTRACT

The synthesis, characterization and study of the aggregation properties in solution of non-coordinating solvents of a Zn(salen) Schiff-Base complex derived from 1,2-cycloexanediamine, through detailed ^{1}H NMR, DOSY NMR, and optical absorption spectroscopy investigations, are reported. It is found that in solution of non coordinating solvents various aggregate species are present. This behavior may be related to the non-conjugated, conformational nature of the bridging diamine of the Schiff-base.

Keywords: Zn^{II} salen complexes, Self-assembly, Chiral complex.

Tetracoordinated Zn^{II} Schiff-base complexes are Lewis acidic species that saturate their coordination sphere by coordinating a large variety of Lewis bases with formation of monomeric species, or in their absence, can be stabilized through intermolecular Zn···O axial coordination involving Lewis basic atoms of the ligand framework with formation of aggregated systems.[1,2] Alternatively, the appropriate design of ligands possessing flexible Lewis donor atoms as side substituents, suitable to axially coordinated the Zn^{II} atom of another molecular unit, allows the achievement of new tailored Zn^{II} supramolecular architectures.[3] For the amphiphilic bis(salicylaldiminato)Zn^{II} Schiff-base complexes having conjugated diamine bridge, the degree of aggregation is influenced by nature of the bridging diamine and concentration of the solution.[1,2]

This contribution presents the study of the aggregation behaviour of a bis(salicylaldiminato)Zn^{II} Schiff-base complex having a conformational flexible bridging diamine, such as the 1,2-cycloexanediamine. Through detailed ^{1}H NMR, DOSY NMR and optical spectroscopic studies, it is found the existence of several species in solution of non-coordinating solvents, with a different disaggregation behaviour and coordination mode around the metal center.

References

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