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Chirality and diastereoselectivity of four coordinated non-planar metal(II)-complexes induced by chiral N⁺O-chelate ligands

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Four coordinated non-planar and C2-symmetrical metal(II)-complexes with tetrahedral to distorted square-planar geometry exhibit chirality-at-metal center induced by chiral N⁺O-chelate ligands. The chirality of the whole coordination unit is designated by Δ (right) - and Λ (left)-handed descriptors. The chirality and diastereoselection of R or S-N⁺O-chelate ligands on coordination with the metal(II) ions will lead to the formation of opposite Λ- or Δ-configuration at-metal center and provide two diastereomers, Λ-M(R-N⁺O)2 and Δ-M(R-N⁺O)2 {or Δ-M(S-N⁺O)2 and Λ-M(S-N⁺O)2}. While the racemic ligands (R/S-N⁺O) provide a mixture of all four diastereomers (Scheme 1). Intra molecular non-covalent interactions that shows within the metal-chiral chelate unit lead to a free-energy divergence between the two diastereomers (Λ vs. Δ), thereby one of the diastereomers is thermodynamically preferred, Λ-M(R-N⁺O)2 {or Δ-M(S-N⁺O)2 } [1-5].

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