containing two crystallographically independent monomeric units that are enantiomers. A refinement of the Flack parameter led to a direct estimation of the enantiomeric composition. Moreover, these structural units show a disorder affecting to heterocycles, probably due to the presence of two enantiomers in the crystal lattice.

The coordination polymer framework consists of chains made up of [Cd₂(μ-Cl)(PtTn)] structural units, each one bound to other two units through chloro bridging ligands. Chains are held together by van der Waals forces and aromatic interactions, forming parallel sheets in such a way that sheets belong to each enantiomer alternate.

Chiral counterions have received increasing attention from the asymmetric catalysis community over the past few years [1]. BINOL is the foremost example of axial chirality. The chiral backbone of BINOL is stereoelectronically stable (atropos) and the enantiomers can be readily resolved [2]; it has been one of the most extensively used motifs in the creation of chiral anions. Some spectacular applications of BINOL-based chiral phosphates in asymmetric catalysis have recently been demonstrated [3], [4]. The bis-BINOL borate 2, initially introduced by Periasamy for the purpose of resolving amino alcohol derivatives [4], has been studied less extensively in the asymmetric catalysis context [5].

The synthesis of bis-BINOL borates from racemic BINOL can yield the homochiral (R,R) and (S,S) diastereomers. Recent studies of bis-BINOL 2 or bifhenol 3 borates by Wuest and co-workers have demonstrated that both form homochiral diastereomers upon crystallisation from a racemic solution in the presence of various amines as well as other counterions [6]. The bis-bifhenol borate anion (3) framework is stereochemically labile (tropos) and the stereoselection is therefore limited to the solid state.

As part of a project designed to study chiral ion pairs of relevance to asymmetric catalysis [7], homochiral racemates of various substituted bis-BINOL borates with sodium as counterion were required. A series of racemic or stereoelectronically labile chiral borate anions based on the 2,20-biphenol motif was investigated [8]. All borates were homochiral in the solid state, although in some cases the heterochiral diastereomers were computed to be thermodynamically preferred (DFT). The crystallographic preference for the homochiral diastereomer was attributed to its lower bulk, higher molecular symmetry, and the therewith associated better packing ability. We report the results of our systematic investigation.