C_2 and C_3 Symmetric Chiral Tetrathiafulvalenes: from Stereogenic Carbon Atoms to Supramolecular Chirality

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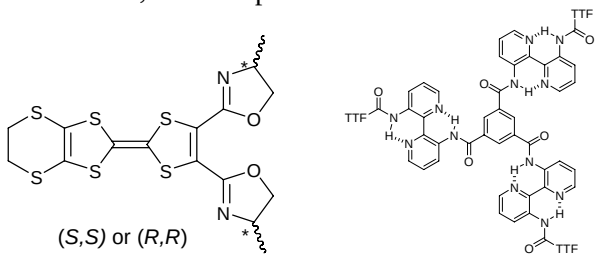
Introduction of chirality into conducting systems is a topic of much current interest as it allows the preparation of multifunctional materials in which the chirality may modulate the structural disorder or expresses its influence through the electrical magneto-chiral anisotropy effect. The access to various chiral electroactive precursors for molecular conductors is therefore of paramount importance [1]. We have recently developed two new families of tetrathiafulvalenes (TTFs) in which the chiral information is expressed in different ways. A first series of chiral TTFs contains a chelating, C_2 symmetric, bis(oxazoline) motif, which is able to coordinate various metal centers. We report herein the synthesis, solid state structures and coordination properties of these TTF-bis(oxazolines) (TTF-BOX) [2]. The second family of precursors we will discuss is based on a C_3 symmetric core decorated with three TTF-amido-bipyridine fragments, which show self-assembling properties. One of the compounds provided for example an electroactive organogel [3]. The ability of TTF derivatives to self-assembly in nanoscopic fibers, rods, ribbons, etc. within gels and corresponding xerogels is determined by the functional group(s) attached to the redox-active core, which will engage, besides the typical stacking and van der Waals interactions between TTFs, in a complex set of non-covalent intermolecular forces.



C_2-symmetric TTF-bis(oxazoline) (left) and C_3-symmetric tris-TTF (right).

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[3] I. Danila, F. Riobé, J. Puigmartí-Luis, Á. Pérez del Pino, J. D. Wallis, D. B. Amabilino, N. Avarvari *J. Mater. Chem.* (2009) DOI : 10.1039/b822884a.