Synthesis and characterization of a tetrathia[7]helicene-based rhenium(I) complex

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Tetrathia[7]helicenes (7-TH), formed by thiophene and benzene rings *ortho*-fused in an alternating fashion, are emerging as one of the most popular class of chiral helical-shaped molecules, thanks to their peculiar electronic and chiroptical properties suitable for manifold applications in different areas of science.[1] In particular, transition metal-based 7-TH systems are an extremely appealing class of complexes, in which the coordination of metals with the π-helical ligand, bearing appropriate coordinating functionalities, provides original chiral architectures. Indeed, the effective functionalization of the α-position(s) of the terminal thiophene ring(s) of the 7-TH scaffold allows the introduction of a variety of substituents, including those with efficient coordinating ability (*e.g.* cyano[2], phosphane[3], phosphine oxide[4]). For example, Rh(I)[5] and Au(I)[6] complexes based on 7-TH phosphanes have been successfully used in the homogenous transition metal catalysis. In our ongoing studies on 7-TH-based organometallic complexes, we have focused on a novel field of investigation concerning the development of rhenium-based polynuclear complexes containing 7-TH phosphine oxide ligands. In this communication, we describe the synthesis and the characterization of a novel dinuclear rhenium(I) complex (Figure 1), along with the elucidation of its tridimensional structure by single crystal X-ray diffraction studies.

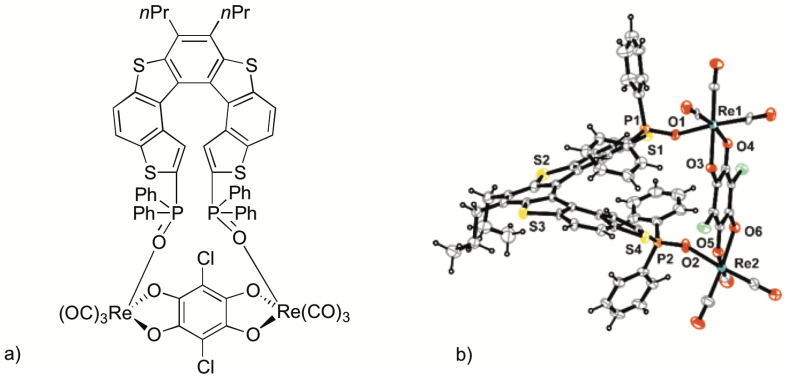

Figure 1. a) Structure of 7-TH-based Re(I) complex ; b) ORTEP view of the complex.

References

1. Licandro, E.; Cauteruccio, S.; Dova, D. *Adv. Heterocycl. Chem.*, **2016**, *118*, 1.
2. Garcia, M. H.; Maiorana, S.; Licandro, E. et al. *Polyhedron,* **2009**, *28*, 621.
3. Dova, D.; Cauteruccio, S.; Licandro, E. et al. *J. Org. Chem.,* **2015**, *80*, 3921.
4. Cauteruccio, S.; Dova, D.; Benaglia, M.; Licandro, E. et al. *Eur. J. Org. Chem.,* **2014**, 2694.
5. Cauteruccio, S.; Forni, A.; Licandro, E. et al *Eur. J. Org. Chem.*, **2011**, 5649.
6. Cauteruccio, S.; Dova, D.; Licandro, E. ; Hashmi, A. S. K. et al *Inorg. Chem.*, **2013**, *52*, 7995.