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A photograph of the Alhambra in Granada, Spain, with the Sierra Nevada mountains in the background. The mountains are partially covered in a red tint, matching the event's color scheme. The foreground is filled with lush green trees.

**ABSTRACTS BOOK**

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## SYNTHESIS OF MESOPOROUS ORGANOMETALLO-TITANIAS USING Ir(III) COMPLEXES AND THEIR APPLICATIONS IN PHOTOCATALYSIS

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Titania (TiO<sub>2</sub>) is one of the most promising materials at present due to its wide range of applications. However, it has some drawbacks due to the high percentage of recombination between the electron-hole pairs, and the high electronic jump between the valence and conduction bands (or bandgap) in any of its polymorphs (of about 3.2 eV), which only allows it to capture 4-5% of the solar spectrum. To solve this problem and get Titania to activate under visible light, there are different strategies. In particular, our groups have developed an *in-situ* method has been used by co-condensation of the Titania precursor (titania tetrabutoxide, TBOT) together with properly functionalized photosensitizers. This synthetic method consists of Sol-Gel Coordination Chemistry, using mild reaction conditions; thus obtaining truly hybrid organotitania materials, in which both organic<sup>[1]</sup> or organometallic<sup>[2]</sup> dyes are integrated within the Titania crystalline structure, resulting in bandgap reduction and a hybrid material with very active and stable photocatalytic properties.

For this purpose, in this communication, two hybrid organometallo-titania materials were synthesized and their electronic structure studied. One of them from the complex [Ir(ppy)<sub>2</sub>(3,3'-H<sub>2</sub>dc bpy)]PF<sub>6</sub> (**1**, Figure 1) and the other material with the new complex [Ir(ppy)<sub>2</sub>(2,2'-bicinchoninic)]PF<sub>6</sub> (**2**, Figure 1). Finally, the comparison of their photocatalytic activity under visible light in liquid-solid medium was carried out, studying the degradation of molecules of a standard dye such as rhodamine 6G, and of other pollutant compounds that do not absorb visible light, and that may be present in wastewater, thus contributing to its purification and corresponding environmental benefit.

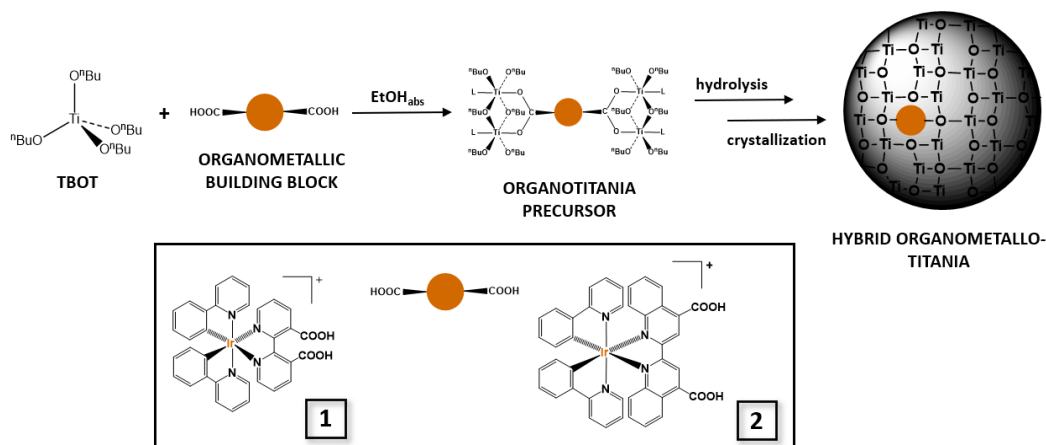


Figure 1.

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