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Heterogeneous photoredox reactions and recyclability of an iridium(III) photocatalyst

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With new advances and a great deal of research being carried out in photocatalytic reactions, increasing attention is being devoted to this field. New synthetic routes can be achieved under mild conditions with excellent results, but the traditionally used photocatalysts are based on organometallic iridium(III) or ruthenium(II) complexes, with poor recoverability and reusability.[1] The increasing price of these metals has necessitated the exploration of heterogenization methods that facilitate their reuse in various catalytic cycles.

Our approach to this problem has been the synthesis of a new type of ionosilica, based on a cationic cyclometalated iridium(III) complex functionalized with triethoxysilane groups, which has been previously reported by our group (Figure 1).[2] This material has been used to study two different reactions, both under an oxidative quenching mechanism, and showing promising results in the recoverability of the material, making this heterogenization method a good alternative for transition metal-based photocatalysts.

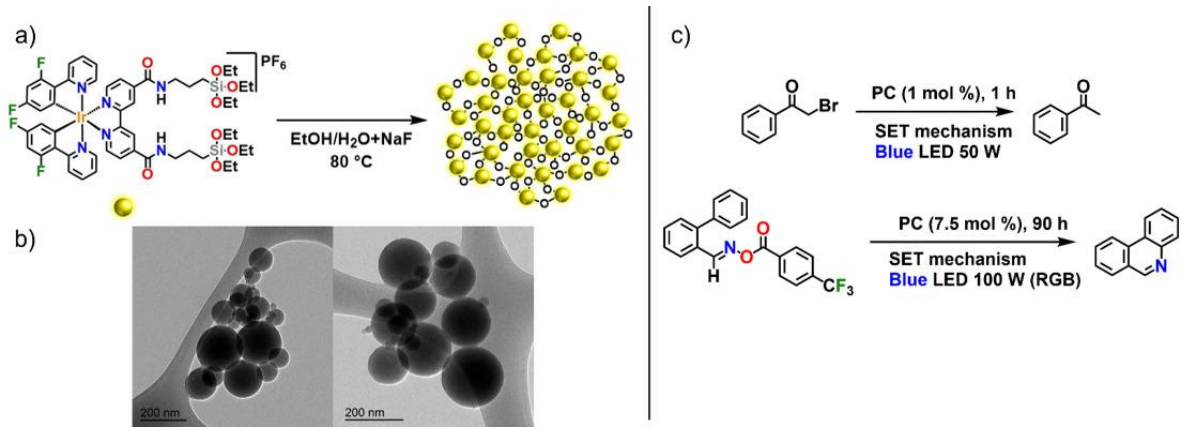

Figure 1: a) Iridium(III) complex and synthesis of the ionosilica; b) Representative TEM images of the material; c) Photocatalytic reactions studied.

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References

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