RATIONAL DESIGN OF PHTHALOCYANINE-PERYLENEDIIMIDE SYSTEMS WITH LONG-LIVED CHARGE-SEPARATED STATE

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Molecular and supramolecular architectures composed of arrays of photoactive moieties ordered in a suitable disposition are of interest because upon selective light excitation of a given chromophore they can undergo directional multi-step electron and/or energy transfer processes. In this direction, phthalocyanines (Pcs) have attracted much attention because their singular electronic properties [1], and have been combined with a large number of electron-poor systems. On the other hand, perylenediimides (PDIs) have demonstrated exceptional photochemical stability, strong absorption of visible light, and high fluorescence quantum yields. Due to these features, PBI derivatives have been used as active components in organic field-effect transistors and photovoltaic cells. [2] In the last few years, an increasing number of PDIs covalently linked to additional electro-active moieties have been reported, thus broadening the scope of their potential applications.

During the last few years we have been involved in the synthesis and characterization of interesting molecular and supramolecular eletroactive systems based mainly on Pcs and PDIs as building blocks [3]. Herein, we will report the more recent results obtained in our group related with the synthesis of the phthalocyanine-perylenedimides arrays [4] (Figure 1) mainly focussed in the synthesis of electron transfer systems, together with the photoinduced electron transfer properties for their application as artificial photosynthetic systems and in organic photovoltaics.

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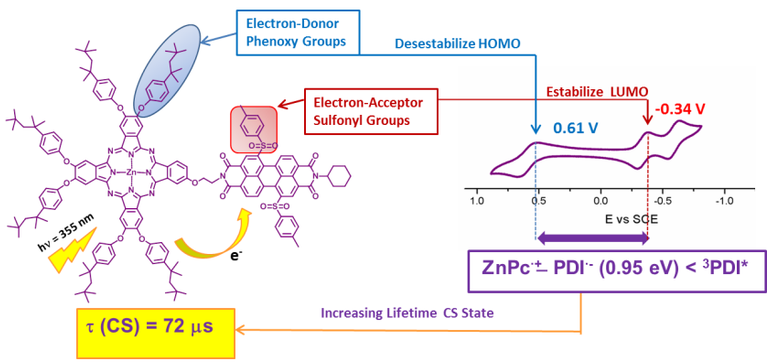

Figure 1. Phthalocyanine-Perylenediimide system with a long-live charge separated state