UTILIZING METAL TO LIGAND CHARGE TRANSFER STATES OF MM QUADRUPLY BONDED COMPLEXES FOR PHOTOVOLTAIC APPLICATIONS

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In this contribution, we report two examples of our efforts to develop MM quadruply bonded complexes for photovoltaic applications. In the first example, evidence, based on femtosecond transient absorption and time resolved infrared spectroscopy, is presented for photoinduced charge transfer from the $Mo_2\delta$ orbital of the quadruply bonded molecule trans-$Mo_2(TiPB)_2BTh)_2$, where TiPB = 2,4,6-triisopropyl benzoate and BTh = 2,2-bithienylcarboxylate, to di-n-octyl perylene diimide and di-n-hexylheptyl perylene diimide in thin films and solutions of the mixtures. In the second example, the structural and photophysical properties of the new compounds trans-$M_2(TiPB)_2(L)_2$ and trans-$M_2(TiPB)_2(L')_2$, where M=Mo or W and L and L' are triphenylamine-cyanoacrylate ligands are presented. These ligands promote intense metal to ligand charge transfer transitions that span the range 550 to 1100 nm. The excited states have been studied by transient absorption and time resolved infrared spectroscopy