

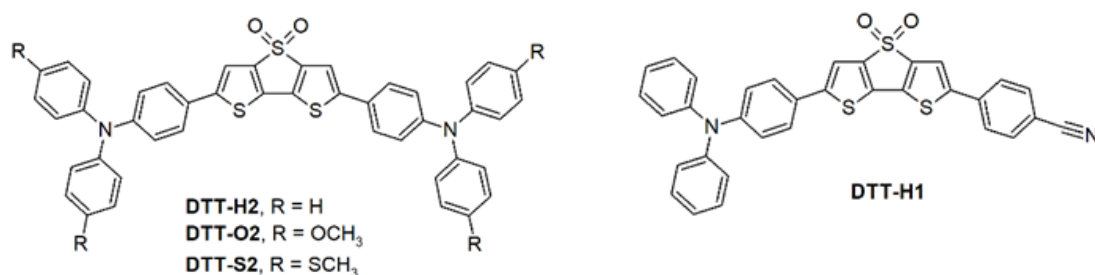
# Dithienothiophene-dioxide Derivatives as Fluorescent Emitters for Luminescent Solar Concentrators

Bartolini M.<sup>a</sup>, Picchi A.<sup>b</sup>, Pryshchepa, H.<sup>b</sup>, Carlotti M.<sup>b</sup>, Pucci A.<sup>b</sup>, Zani L.<sup>a</sup>, Calamante M.<sup>a</sup>

<sup>a</sup> Institute of Chemistry of Organometallic Compounds (CNR-ICCOM), Via Madonna del Piano 10, 50019 Sesto Fiorentino, Italy

<sup>b</sup> Department of Chemistry and Industrial Chemistry, University of Pisa, Via G. Moruzzi 13, 56124 Pisa, Italy  
matteo.bartolini@cnr.it

Luminescent Solar Concentrators (LSCs) are semi-transparent devices constituted by a sheet of glass or polymeric material with a high refractive index, doped with a luminophore able to absorb incident light and re-emit it at longer wavelengths.<sup>1</sup> Thanks to their peculiar working principle, they have emerged as a unique light management technology, with applications spanning various fields, from photovoltaic to indoor lighting, photochemistry, and optical communication.<sup>2</sup> In our work, we present four conjugated donor-acceptor luminophores featuring a central dithieno[3,2-*b*:2',3'-*d*]thiophene-4,4'-dioxide (*do*-DTT) core, with either a symmetric or non-symmetric structure (Figure 1), designed based on DFT computational investigations and prepared using direct arylation reactions as the key C-C bond-forming steps. Their performances were screened in thin-film LSCs employing both poly(methylmethacrylate) (PMMA) and regenerated MMA as host matrixes, reaching a remarkably external photon efficiency ( $\eta_{\text{ext}}$ ) of up to 6.7% together with a fluorescence quantum yield ( $\Phi_{\text{fl}}$ ) of 90%, which resulted in a device efficiency of 0.74% once the LSC was coupled with a Si-PV cell.



**Figure 1.** *do*-DTT-based synthesized compounds.

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