



Linearly π -conjugated oligothiophenes as simple metal-free sensitizers for dye-sensitized solar cells

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Résumé en anglais	<p>Four linear oligothiophenes containing 4, 5 and 7 thiophene rings substituted by a variable number of octyl chains attached at the beta-position of some of the thiophene rings and possessing a terminal cyanoacrylic acid anchoring group have been synthesized. Results of UV-Vis absorption spectroscopy and cyclic voltammetry show that as expected the extension of the π-conjugated system leads to a decrease of the optical gap with an increase of the HOMO level. The four compounds have been evaluated as sensitizers in dye-sensitized solar cells (DSSCs) using a iodide/triiodide liquid electrolyte and the results are discussed in terms of the structure-property relationship with regard to the extension of the conjugated system and the number and position of the octyl side chains using N719 as the reference system. A power conversion efficiency of $\sim 7.30\%$ corresponding to 90% of the value given by N719 under identical conditions has been obtained with one of the heptamers.</p>
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