Synthesis and Electronic Properties of Adducts of Thiophene-Based
π-Conjugated Systems and Fullerene C_{60}

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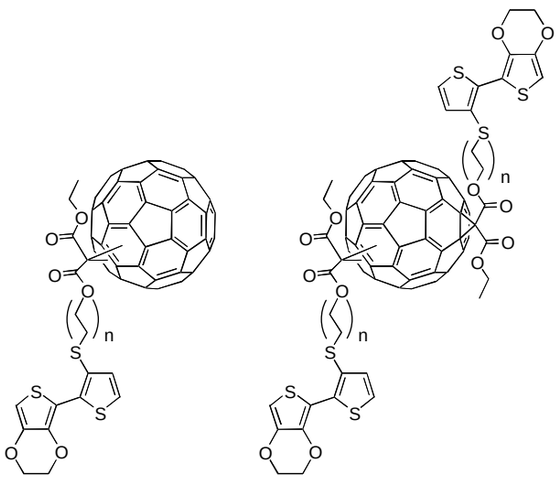
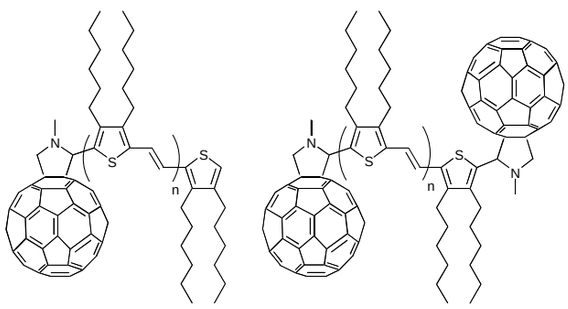
Hybrid molecular architectures involving C_{60} groups covalently attached onto π-conjugated polymers and oligomers have attracted considerable interest in the general context of photovoltaic solar energy conversion (1-3).

We report here the synthesis and preliminary characterization of new series of C_{60}-derivatized poly(thiophenes) obtained by electropolymerization of precursors in which one or two tailored polymerizable precursor groups are attached to C_{60} *via* alkyl spacers of different lengths (4).

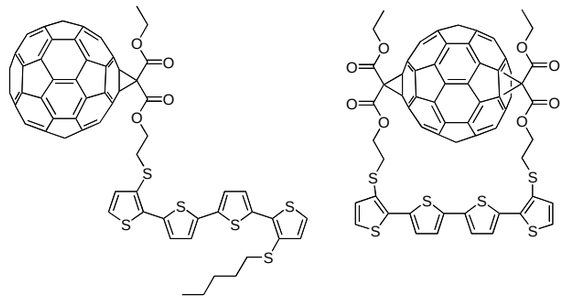


On the other hand, owing to their small HOMO-LUMO gap, oligothienylenevinylenes (nTVs) are potentially interesting for light harvesting in organic photovoltaic devices. Thus, we also describe here the synthesis of various adducts of nTVs of increasing length with C_{60} together with preliminary investigations of their electrochemical and optical properties (5).



n = 1, 2, 3, 5 n = 1, 3, 5, 7

Finally, the synthesis of two quaterthiophene-C_{60} fullerene dyads in which the C_{60} group is either singly or doubly connected to the inner β-position of the terminal thiophene rings will be presented. The electronic properties of these compounds have been analyzed by UV/Vis spectroscopy and cyclic voltammetry while an orientational effect on the photophysical properties of quaterthiophene-C_{60} dyads has been evidenced (6).



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