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**Title:**

Reactivity studies of thienyl and (oligo)thienylpyrroles

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**Abstract:** (Your abstract must use **Normal style** and must fit in this box. Your abstract should be no longer than 300 words. The box will 'expand' over 2 pages as you add text/diagrams into it.)

Currently, a variety of synthetic approaches to substituted pyrroles exist, although their synthesis, in general, remains challenging. Often, the yields are rather low and a significant number of by-products, such as undesired regioisomers, are obtained. Furthermore, pyrroles are susceptible to chemical degradation as they are rather easily oxidized; this further hampers their synthesis and especially their isolation and purification.<sup>1</sup>

The chemistry of thienylpyrroles is a very recent field in the chemistry of heterocyclic compounds. In the last few years, synthetic 2-thienylpyrrole derivatives have come in focus. However, even more than 60 years since the first 2-thienylpyrrole: *bis*-2-[5-(2-thienyl)pyrrole]azametine dihydrochloride) has been reported by Edward Knott<sup>2</sup> at Kodak, the synthesis of functionalized thienyl and (oligo)thienylpyrroles remains challenging. Often, the yields are low and the regioselectivity is only modest.<sup>3</sup>

Before our recent work,<sup>3,4</sup> only a few papers were published concerning the regioselectivity studies of 1-(alkyl)aryl-2-thienylpyrrole systems. Following our interest in the chemistry and optical applications of new functionalized systems bearing thiophene and pyrrole rings we have used heterocyclic systems **1** bearing pyrrole and thiophene rings (1, 2 or 3) as precursors for the synthesis of functionalized pyrrole derivatives. Compounds **1** have proved to be versatile substrates in several reactions (aromatic electrophilic substitutions: azo coupling, direct tricyanovinylolation reaction, Vilsmeier-Haack formylation) and metalation followed by reaction with DMF, allowing the preparation of interesting new donor-acceptor substituted heterocyclic systems, selectively functionalized on the pyrrole **2** or on the thiophene **3** rings. Precursors **1** were prepared through a palladium-catalyzed decarboxylative cross-coupling reaction. The structures of the new compounds were unambiguously confirmed by their analytical and spectral data.

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