Long Oligofurans - Synthesis, Reactivity and Devices

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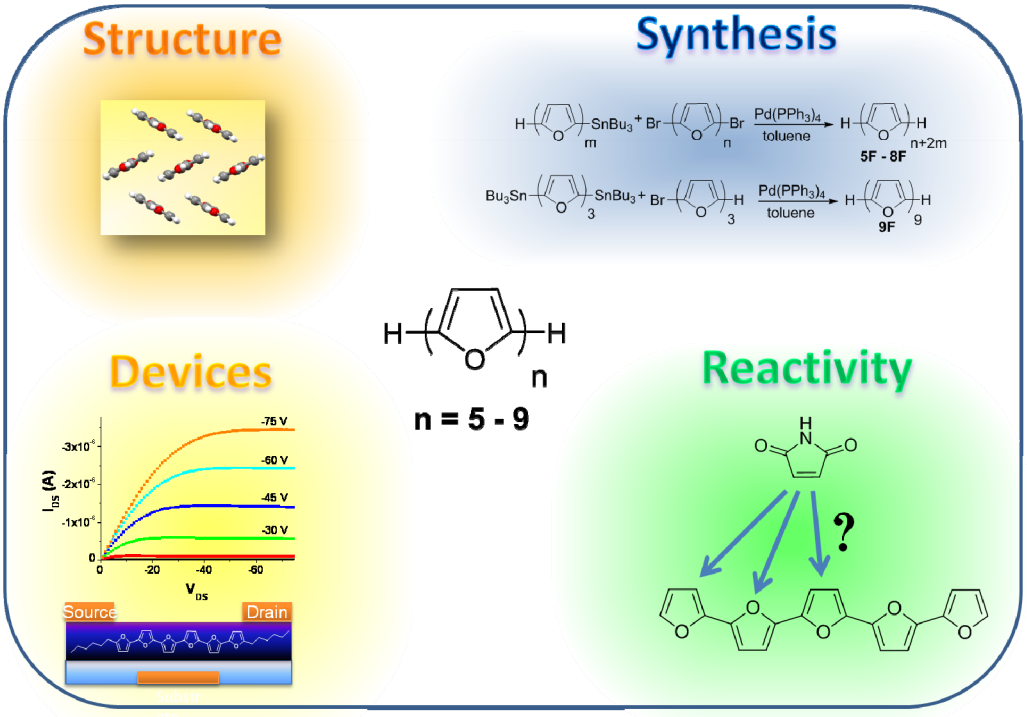
Despite the diverse applications of organic electronic materials, only a limited number of families of these materials have been developed. Long α-oligothiophenes (particularly α-sexithiophene) and oligoacenes (particularly, pentacene) have been extensively studied. Yet, while oligothiophenes are intensively studied, their close analogs, long α-oligofurans were not known. In this lecture, I will discuss the synthesis and characterization of a series of long unsubstituted α-oligofurans (up to n=9).[1] Interestingly, α-oligofurans are more fluorescent, exhibit better solid state packing, and show higher rigidity than oligothiophenes, and are more soluble than oligothiophenes. Additionally, unlike other popular oligomers in organic electronics, furans can be obtained from renewable resources, and furan contained materials should be biodegradable. Oligofurans show high field effect mobility, similar to oligothiophenes (up to 0.07 V cm^{-1} s^{-1}) and high on/off ratio (10^6), which makes them attractive for future device applications. Finally, oligofurans show interesting selectivity in Diels-Alder cycloaddition, which is remarkably different from oligoacenes.



[1] O. Gidron, Y. Diskin-Posner, and M. Bendikov, *J. Am. Chem. Soc.* **2010**, *132*, 2148-2150.