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Conjugated Polymer's Side Chains Post-Processing for Improved Molecular Packing and Mobility of Organic Thin-Film Transistors (OTFTs)

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Soluble conjugated polymers have nowadays attracted broad academic and industrial spotlight as innovative materials of easy tuneable optical and electronic properties.[1] These properties translate into various optoelectronic applications such as organic solar cells, light-emitting diodes (LEDs), and thin film transistors. The pivotal parameters that define characteristics of conjugated polymer based devices are of chemical (structure, solubility, mass) and mechanical (macroscopic) nature.[2] Although the physical properties CPs is determined by designed chemical structure, critical alterations result from variations of the nanostructure of the polymer in its solid state.[3] Therefore the complete optoelectronic potential of CP based device can be fully assessed only with the optimal conjugated chains alignment.

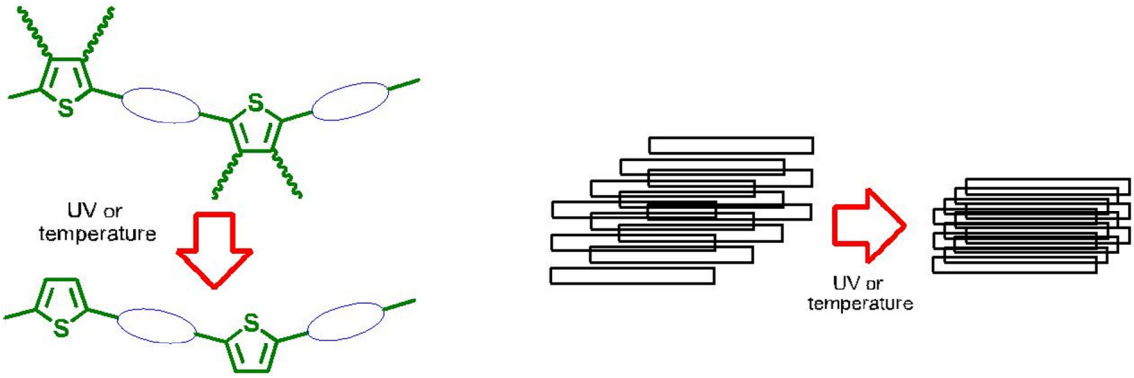

Fig 1. Effects of post processing in molecular and nanoscales

We envisioned thermal and UV induced post processing of conjugated polymers predesigned to dramatically change their properties in given conditions by removal of nonconductive side chains and reducing interlayer distance.

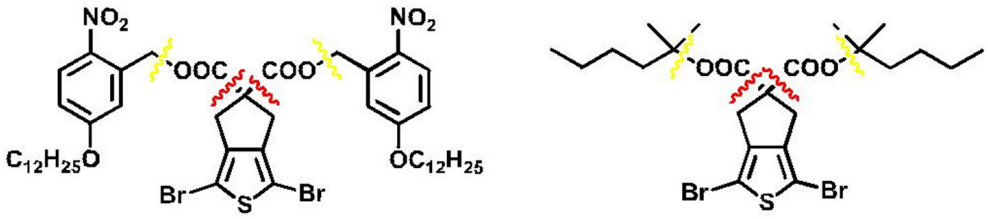

Fig 2. Candidate monomers, with predicted braking points.

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