From One- to Three-Dimensional Organic Semiconductors: In Search of the Organic Silicon?

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Résumé en anglais	Organic semiconductors based on π-conjugated systems are the focus of considerable interest in the emerging area of soft or flexible photonics and electronics. Whereas in recent years the performances of devices such as organic light-emitting diodes (OLEDs), organic field-effect transistors (OFETs), or solar cells have undergone considerable progress, a number of technical and fundamental problems related to the low dimensionality of organic semiconductors based on linear π-conjugated systems remain unsatisfactorily resolved. This low dimensionality results in an anisotropy of the optical and charge-transport properties, which in turn implies a control of the material organization/molecular orientation during or after device fabrication. Such a constraint evidently represents a problem when device fabrication by solution-based processes, such as printing techniques, is envisioned. The aim of this short Review is to illustrate possible alternative strategies based on the development of organic semiconductors with higher dimensionality, capable to exhibit isotropic electronic properties.
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