第235回 OPERA研究交流セミナー
第226回 ISIT有機光エレクトロニクス研究特別室セミナー
第293回 未来化学創造センターセミナー

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Functional (macro)molecules of controlled pi-Interactions for optoelectronics

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The performance and stability of electronic and photonic devices are intimately linked to the way how molecules organize themselves and interact. Thus, the transport of charges in organic semiconductors takes place in a preferred direction where the stacks of p-conjugated systems are the most favorable. Conversely, in photoactive materials of electro-optical devices (light emitting diodes, laser diodes...), it is necessary to spatially separate the photoemissive systems to avoid luminescence quenching. This control of self-association can be achieved by acting on three parameters : i) the nature of the p-conjugated species, ii) the functionalization by flexible chains (usually aliphatics) and iii) the geometrical parameters. In most cases, flexible chains that are used for functionalization are (branched) aliphatic chains. However, the use of siloxane chains have recently attracted much interest for their extreme flexibility and their strong ability to segregate from most chemical groups. In this communication, we will illustrate the remarkable role of siloxane chains to control the p-interactions of molecular systems through different examples. In particular, we will show how siloxane chains can improve the stacking of p-conjugated polymer semiconductors, ultimately leading to a significant enhancement of the charge transport properties. In another respect, we will demonstrate the singular role of siloxane chains to prevent the cristallisation of p-conjugated molecules to lead to room-temperature liquid semiconductor and/or light emitter.

主催：九州大学　最先端有機光エレクトロニクス研究センター
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