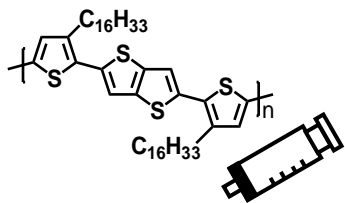


High mobility and Solution Processable Polymer Thin-film Transistor

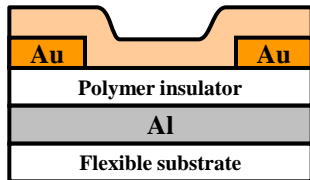
Associate Professor Daisuke Kumaki

Device Structure of Polymer TFT

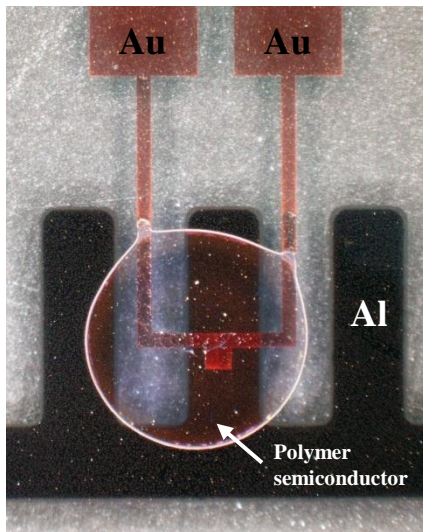
Molecular structure of polymer semiconductor



Polymer Semiconductor layer



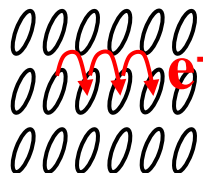
Cross-sectional image



Photograph

Electrical conduction in organic semiconductor

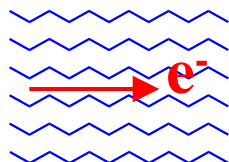
Small molecule semiconductor



Hopping conduction
< 10 cm²/Vs



Polymer semiconductor



Intramolecular conduction
~ 1000 cm²/Vs

Content :

Organic semiconductor devices with light weight and flexibility have been attracting much attention. Especially semiconducting polymers are promising candidate for low cost and large area electronic devices, because they can be made by the printing fabrication process from semiconductor solution (see above).

In addition, the semiconducting polymer has a more extended π -electron system than the small molecule semiconductor. Therefore, by controlling the molecular order of the polymer main chain and by using the intramolecular conduction along the polymer chain, we can significantly improve the charge mobility in the polymer thin-film transistor (see below). We are developing the flexible electronic devices based on the semiconducting polymers.

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