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Recent Progress in Organic Transistors

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In recent years, the development of an organic thin-film transistor has accomplished remarkable progress. Even in the organic thin film transistor produced by a printing process, over $1 \text{ cm}^2/\text{V}$ of field effect mobility came to be obtained. In this talk, I will introduce several preparation techniques of these organic transistors to show high FET performance. In order to prepare an organic transistor by printing techniques, it is important to control the preparation condition, which is strongly dependent on the organic semiconductor materials. We have examined several printing techniques and found that the control of the crystallization point is important to obtain an organic thin film with high quality for transistors. And I will also mention about the factors that govern the stability of the device operation. Especially, it is important to clarify about the control factor of the threshold voltage, to secure the reliability of the organic device. This is the biggest research subject for the organic transistors in next stage.