MERIT Internship Report (Domestic)

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Term

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Place

ORGANO-CIRCUIT INC.

Theme

Study on flexible display using organic semiconductors

Contents of internship

ORGANO-CIRCUIT INC. is a venture company from the University of Tokyo and was founded on June 16, 2015. ORGANO-CIRCUIT INC. develops large-area flexible display products using organic semiconductors from the Takeya laboratory of the University of Tokyo. This organic semiconductor material is characterized by the ability to produce high-quality single crystal thin films by solution coating. It is possible to produce high-performance thin-film TFT devices at low cost because it can achieve high mobility of 10 cm^2 / Vs or higher. Since it can be manufactured at a low temperature by a solution method and be formed on a flexible substrate such as a PET substrate at low cost, it can be applied to a flexible display having a large area and being flexible and lightweight. When a conventional display is made large, there is a problem that installation cost is required due to its weight. In addition, when the area is increased, there is a problem that the conventional display becomes very expensive. The realization of this large area, inexpensive and lightweight flexible display can be expected to solve these problems.

In this internship, I tried to optimize the flexible display manufacturing process. First, I engaged in the photolithography of the silver electrode pattern, which is indispensable for the production of the active matrix. Next, I worked on the application of the organic semiconductor layer, which is the most central part that affects the function of the device. Lastly, I optimized the laser cutting conditions when dividing each device for conditions of output light that could realize

a good profile. In the future, I hope to contribute to further improving the quality of flexible displays using the conditions obtained this time.

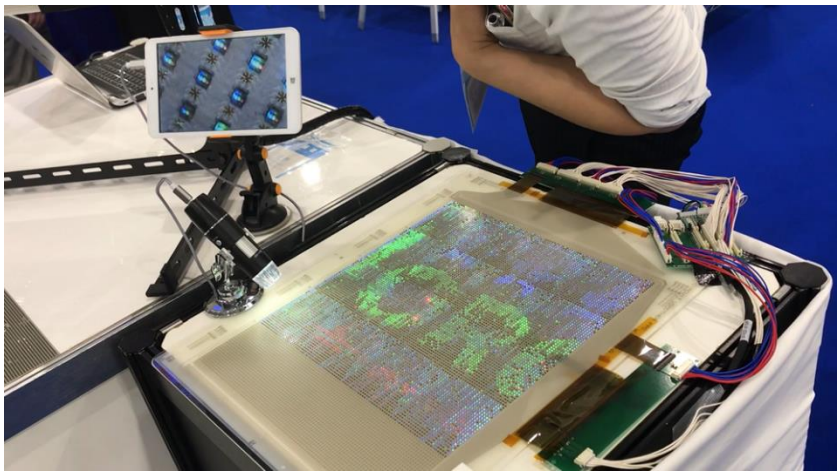

Figure 1. Flexible display with organic TFT

In addition, I worked on introducing exhibitions at Innovation Japan. We exhibited flexible displays to various companies and worked on product explanations. Through questions and suggestions from the corporate perspective, such as issues related to commercialization and sales strategies, I was able to directly touch on a series of flows from basic research to commercialization. I want to make full use of my experience gained in this internship for my future research.

Acknowledgements

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