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1. Main Research Results

- 1) We invited Dr. Siang-Fu Hong from National Taiwan University (NTU) from 1st July to 31st, July, 2010, and studied a new processing method for electrochromic devices by ink-jet using solution of Prussian blue (PB) nano-particles on transparent electrodes. We observed that the thickness was larger at the edge of the pattern, i.e., “Coffee Stain Effect”. Several approaches were tried to fabricate different morphologies and enhance the uniformity of inkjet printing PB spots.
- 2) We collaborated with Prof. Heeyeop Chae from Sungkyunkwan University, Korea, who stayed at AIST from 26th July to 3rd September, 2010 on sabbatical leave for the study of polymer light-emitting diodes. We used a vacuum evaporation system capable of fabricating multi-layer film structures with organic and inorganic materials maintained as a common instrument for the global COE base. In addition to the conventional ITO, we used organic ITO-free transparent electrodes developed by a Japanese company processed by a dispenser system. The result was presented at the Asian Conference on Organic Electronics organized in Seoul University in Korea. I visited Sungkyunkwan University after the session, and gave a seminar.
- 3) We invited DaeJin Shim from Prof. Chae’s laboratory in Sungkyunkwan University from 31st January to 26th February, 2011 by this global COE program. He studied solution process of small molecular organic light emitting diodes (OLEDs), which are usually fabricated by vacuum evaporation. For the first trial towards multi-layer structures, which is challenging for the wet process, we fabricated bi-layer structure using different solvents for each layer. Secondly, we used ITO free transparent electrodes for the substrates of the monolayer devices. We measured the basic properties of the fabricated devices, and characterized the performances.

2. Oral Presentation in International Conferences

- 1) Printed/Coated Non-volatile Displays with Electrochromic Nanoparticle Ink, Tohru Kawamoto et al., International Display Workshop '10 (2010.12.10 Fukuoka, Japan).
- 2) Direct Deposition Process of Organic Transparent Electrodes from Syringe,

Wataru Mizutani et al. Asian Conference on Organic Electronics (2010.11.5, Seoul, Korea)