


Physical Properties of Organic and Inorganic Functional Materials and their Applications		
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Research Topics

- Preparation of organic molecular thin film; treatment and evaluation of orientation
- Preparation and characterization of transparent conductive film
- Polarized ultraviolet, visible, infrared absorption spectroscopy and Raman spectroscopy

Research Seeds

In flat panel displays (FPDs) and the like, thin films using various functional materials are applied. Such films include liquid crystal molecule thin films, transparent conductive films, alignment films, and polarizing films. Those have been mentioned, and various research results have been reported respectively. Nevertheless, despite many reports on the physical properties of individual functional materials, few cases exist of individual functional materials evaluated by measuring dynamic characteristics by model FPD (Fig. 1 and 2). In this laboratory, we developed functions by expressing functions and controlling functions by controlling morphology of organic and inorganic functional materials, developing functional materials applicable to FPD and the like, creating motion models, and evaluating the operating characteristics of model FPD. We are working to verify the performance of organic and inorganic functional materials.

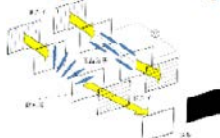


Fig. 1 Measurement arrangement.

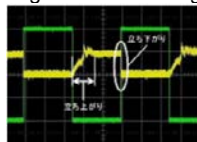


Fig. 2 Measurement result example.

In this laboratory, spin coating is carried out using a self-made spin coater in a small scale clean room located in the department to which it belongs; a low-temperature sintering process is carried out with a dry oven disposed in the same room. To fabricate of the transparent conductive film, an RF magnetron sputtering apparatus is arranged in the department where it is used. To evaluate the characteristics of the thin film produced, various spectroscopic analyzers such as polarized FT-IR (transmission, ATR, diffuse reflection), UV-Vis (double beam, transmission, reflection) and portable Raman, XGT, digital multimeter, and LCR meter. For evaluation of the dynamic characteristics of the model FPD, we used a self-made measuring system with a combination of a laser light source, various polarizers, a function generator and a DC power source, a high-speed / high sensitivity photometric element, 1 GHz band digital oscilloscope, etc. We also use polarizing microscope located in the laboratory to observe the anisotropy of liquid crystal molecules and so on.

Related Technology