

Onoda and Shimonoseki Area

Development of Enhanced Digital Materials with New Hybrid Nanoparticles and their Application to Energy-saving Liquid Crystal Displays

Project Promotion

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Core Research Organization

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Major Participating Research Organizations

Industry•••UBE INDUSTRIES,LTD.,
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Tokuyama Corporation, Ube Material Industries, Ltd.,
HUNET Inc., NanoOpto Laboratories, Inc.,
Choshu Industry Co., Ltd., SHINTEC, INC.,
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Aim of research and development

This project aims to develop the technology to provide a new function to the liquid crystal displays and the related materials by using the nanoparticles. Thus, it aims to develop a science and technology to synthesize and mass-produce "hybrid nanoparticles" composed of various nanoparticles and organic protective agents as well as research and development of new digital materials which can be applied to an energy-saving type of liquid crystal displays, and their production processes.

Contents of research

1. Development of technologies to synthesize new hybrid nanoparticles including metals, semi-conductors and polymers, and to disperse them into liquid crystal media
The synthetic methods of various new hybrid nanoparticles dispersed in liquid crystal media and their stabilization methods will be developed to provide materials required to develop nanoparticle-doped liquid crystal displays working at a low voltage with fast response.
2. Synthesis of oxide nanoparticles, and development of hybridization technology with polymeric membranes and liquid crystals
The various synthetic methods of oxide nanoparticles will be examined, and the synthetic technique of the hybrid oxide nanoparticles that can be dispersed to the liquid crystal media and the liquid crystal display materials will be established. This aims to apply to an energy-saving type liquid crystal display materials to be operated at a low voltage.
3. Assembly and evaluation of nanoparticle-doped liquid crystal displays of low power consumption
The LCD modules which are doped with the hybrid nanoparticles developed in the researches of 1 and 2 are assembled for evaluating their functions of energy saving at a low operating voltage with fast response. Thus, it aims to achieve the energy saving liquid crystal displays and their practical use.
4. Development of liquid crystal display manufacturing process for energy-saving technologies
Research and development of technologies for energy-saving and high performance with nanoparticle-doped liquid crystal displays are conducted by applying nanoparticle materials

