# Liquid Crystal Alignment on Self-Organized Microwrinkles

T. Ohzono, H. Monobe, Y. Shimizu

*Nanotechnology Research Institute (NRI), National Institute of Advanced Industrial Science and Technology (AIST) 1-8-31 Midorigaoka, Ikeda, Osaka 563-8577 Japan*

Nematic liquid-crystal (LC) molecules are automatically aligned on an anisotropic surface morphology[1], a phenomenon critical to the function of the LC displays. Here, we show that microwrinkles may also be quite useful for LC alignment. Microwrinkles (Fig. 1) are spontaneously formed on a thin and relatively hard layer supported by a soft material under an in-plane compressive strain[2-3]. The morphology of microwrinkles, such as the periodicity, amplitude and anisotropy of the wrinkle grooves, can be controlled by the thickness of the hard layer and the in-plane strain state[3]. As a result, clear LC alignment was observed for the uniaxially anisotropic microwrinkles (Fig. 2) even with very shallow sinusoidal grooves[4]. We have also found that the LC order parameter decreases with decreasing the anisotropy in the microwrinkles.

(1) D.W Berreman *Phys. Rev. Lett.* **1972**, *28*, 1683
(2) J. Genzer, J. Groenewold *Soft Matter* **2006**, *2*, 310
(3) T. Ohzono, M. Shimomura *Phys. Rev. B* **2004**, *69*, 132202
(4) T. Ohzono, H. Monobe, Y. Shimizu
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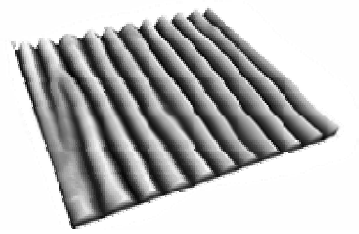

Fig. 1. Topography of the self-organized microwrinkles for LC alignment. ($11^2$ μm$^2$)

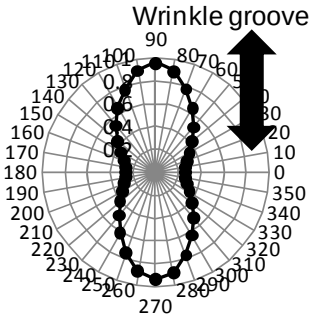


Fig. 2. Angle-dependent IR absorption of the CN-stretching of the 5CB on microwrinkles