

Atomic Force Microscopy and I-V Characteristics of FLC-QDs composites

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Cadmium selenide quantum dots (QDs) dispersed homogenous ferroelectric liquid crystal (FLC) matrix is presented to disclose the interaction of FLC molecules with those of QDs using atomic force microscopy. Here, QDs and FLC molecules have same order of dimension, therefore QDs uniformly fit in FLC matrix without perturbing the helicoidal geometry and order parameters of host matrix. The dispersion of QDs in host FLC evinces the better contrast, faster electro-optical response and remarkable shift in the SmC*-N* phase transition temperature. These advanced features of FLC-QDs composite indicate its potential application in FLC display. In addition to these merits, QDs concentration dependent I-V characteristics reveal its interesting applications in semiconducting diodes having the pico-ampere current sensitivity. The I-V curves also suggest the QDs concentration dependent tunnelling phenomenon in FLC-QDs composites.

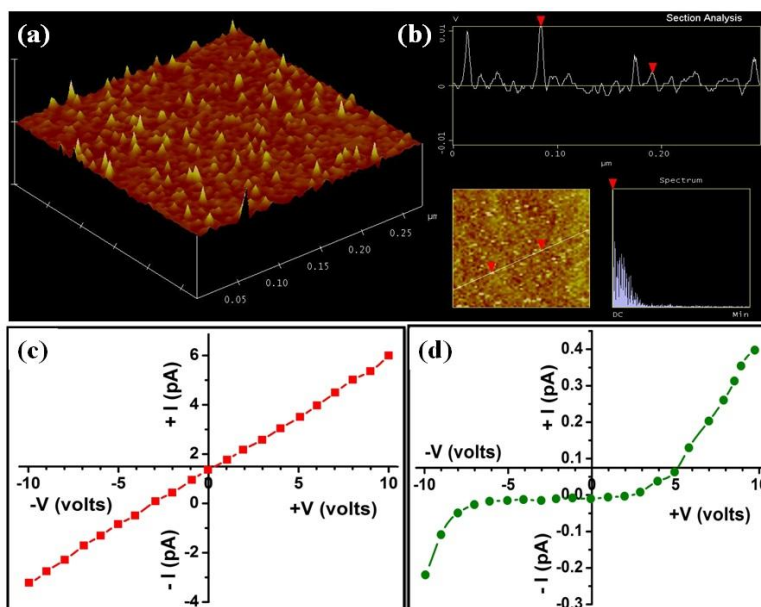


Fig. 1. (a) AFM image of QDs dispersed FLC, (b) height profile, and I-V curves for (c) 0.1wt% and (d) 0.3wt% of QDs in FLC matrix.

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References

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