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Increasing Dispersion of Quantum Dots in Liquid Crystal Using Mesogenic Ligands ZACHARY NUNO, ANDREA RODARTE, BLESSING CAO, RONALD PANDOLFI, MAKIKO QUINT, SAYANTANI GHOSH, JASON HEIN, LINDA HIRST, University of California, Merced — High concentrations of quantum dots (QDs) dispersed in liquid crystal materials will tend to aggregate together. One reason for this is the elastic cost of local liquid crystal alignment with the ligands on the surface of the QDs. We use mesogenic ligands with a flexible arm to allow the ligands to align with the director axis of the liquid crystal, thereby reducing aggregation and promoting QD dispersion in the host material. The dispersion of CdSe (core only) and CdSe/ZnS (core/shell) QDs with isotropic and mesogenic ligands is compared using fluorescence microscopy, x-ray scattering, and scanning confocal microscopy. The results from these techniques demonstrate that the mesogenic functionalized QDs do not aggregate into dense clusters as observed with the isotropic functionalized QDs.

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