Topological nanocolloids ith facile electric s itching of plasmonic properties

Ye Yuan[1] **and Ivan I. Smalyukh**[1,2,3,*]

[1]Department of Physics, University of Colorado, Boulder, Colorado 80309, USA
[2]Materials Science and Engineering Program, Department of Electrical, Computer and Energy Engineering, Liquid Crystal Materials Research Center, University of Colorado, Boulder, Colorado 80309, USA
[3]Renewable and Sustainable Energy Institute, National Renewable Energy Laboratory and University of Colorado, Boulder, Colorado 80309, USA

(YA-12, Yale Apparatus) while stirring the mixture mildly within 6 min at room temperature. This procedure results in the formation of silver-gold-alloy triangular nanoframes [Fig. 1(d)] in a process schematically depicted in Fig. 1(a). Interestingly, nanoframes with multiple holes (different large genus) are obtained at the intermediate stages of this synthesis procedure; an example of such large-genus particles obtained

[Fig. 2(c)]. This free energy analysis of equilibrium orientations agree with our experiments [Figs. 2(d), 2(e), and 3(d)].

The extinction spectra of silver–gold nanoframes in water shown in the top left inset of Fig. 2(d) are qualitatively consistent with previous literature reports [21], albeit our particles are somewhat larger and our synthesis procedure was modified as compared to these previous studies in the effort to obtain approximately square cross-sections and $g = 1$, as discussed above. When redispersed in 5CB, the spectra retain similar features as in water, although the higher effective refractive index of this LC dispersion medium (ranging between the 5CB's
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We have confirmed that the silver–gold nanoframes remain dispersed as individual nanoparticles at concentrations ranging from individual particles to the highest used concentration of 1 pmol/mL. The quality of LC alignment is not compromised by the presence of these nanoparticles, and the appearance and switching of the glass cells filled with 5CB-nanoframe composites is very much similar to that of pristine 5CB. Dark field microscopy [Fig. 3(c)] reveals that the frame-shaped particles