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Interaction of a Bi-molecular Liquid Crystal Film With Functionalized Nanoparticles[1] JEFFERSON W. TAYLOR, LUZ J. MARTINEZ-MIRANDA, University of Maryland, LYNN K. KURIHARA, Naval Research Labs — We investigate the properties of a nominally bi-molecular film of liquid crystal mixed with a magnetic nanoparticle (CoFe) that was functionalized with an organic compound (MHDA or APTS) with the atomic force microscope (AFM). We seek to investigate if the functionalization compound has an effect on the ordering of the liquid crystal in the vicinity of the nanoparticle. Studies in bulk liquid crystals have shown that the functionalization compound influences how the liquid crystal will reorganize.[2] The results of this investigation are compared to the results of work done on phospholipids in close contact with uncovered silica nanoparticles.[3] There seems to be a relation between the way that the two functionalizations behave in the bulk 8CB. The two functionalizations studied behave differently for particles larger than 22 nm, and apparently for the smaller particles.

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[2]L. J. Martínez-Miranda, and Lynn Kurihara, *J. Appl. Phys, 105,* p. 084305 (2009).
[3]Yuri Roiter, Maryna Ornatska, Aravind R. Rammohan, Jitendra Balakrishnan, David R. Heine, and Sergiy Minko, *Langmuir*, 25, 6287-6299 (2009).

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