Magnetic Liquid Crystal Polymers

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The combination of liquid crystal polymers with magnetic particles can open up possibilities for new technological applications. These magnetic field sensitive elastomers represent a new type of composites consisting of small magnetic particles, in the nanometer range, dispersed in an elastic polymer matrix which can be oriented. (1) To form such magnetic liquid crystal polymers, the magnetic particles can be incorporated into the elastic body. If a uniform magnetic field is applied to the reactive mixture during the cross-linking process, particles could be locked into an oriented elastomer. The resulting composites should exhibit anisotropic properties. (2) The magnetic particles can also be synthesized into the liquid crystalline matrix in order to modify their size and/or their distribution. The synthesis of nanoparticles with controlled size and controlled morphology is of great fundamental and technological interest (3). We present here the synthesis and incorporation of ferromagnetic nanoparticles of cobalt into a liquid crystal polymer matrix.

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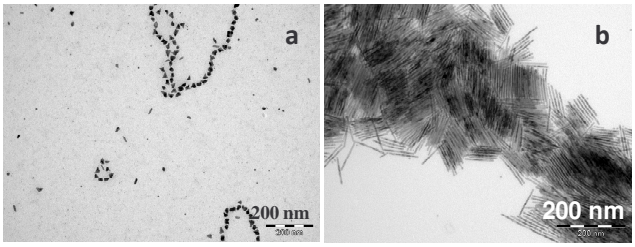
(3) H. Bönnemann and K.S. Nagabhushana, *Encyclopedia of Nanoscience and Nanotechnology*, H.S. Nalwa (Ed.), Am.Sci. Publ. **2004**, *1,* 777.



a- cobalt nanoparticles about 19 nm after precursor decomposition into the liquid crystal polymer matrix
b- nanorods of cobalt about 83 nm length