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Magnetic-Field Induced Diffraction Patterns from Ferrofluids CORNELIU RABLAU, PREM VAISHNAVA, Kettering University, Flint, MI, GAVIN LAWES, RATNA NAIK, Wayne State University, Detroit, MI — Ferrofluids are stable colloidal suspensions of superparamagnetic nanoparticles in a carrier liquid. We report studies of magneto-optic properties of two ferrofluid systems consisting of tetramethyl-ammonium-hydroxide (TMAH)-coated and of dextran-coated Fe_3O_4 nanoparticles of nominal sizes of 6 nm and 12 nm respectively suspended in water. Both samples showed superparamagnetic behavior. The static and timedependent DC-magnetic-field-induced light scattering patterns produced by two orthogonal He-Ne laser beams passing through the ferrofluid samples revealed significant different optical signatures for the two surfactants. Notably, in contrast to the linear diffraction pattern produced by TMAH-coated nanoparticles, a circular diffraction pattern is reported – for the first time – in the dextran-coated ferrofluid.

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