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**Magnetic and structural properties of ferrofluids based on Cobalt-Zinc ferrite nanoparticles**[1] P. PRIETO, J. LOPEZ, M.E. GOMEZ, J. PRADO, J. CAICEDO, G. ZAMBRANO, CENM Universidad del Valle, L. GONZALEZ, Depto Quimica Universidad del Valle, J. ESTEVE, Universitat de Barcelona, Catalunya, Spain — Ferrofluids are colloidal systems composed of a single domain of magnetic nanoparticles with a mean diameter around 10 nm, dispersed in a liquid carrier. Magnetic $Co_{(1-x)}Zn_xFe_2O_4$ ferrite nanoparticles were prepared via co-precipitation method from aqueous salt solutions in an alkaline medium. The composition and structure of the samples were characterized through EDX and XRD, respectively. Transmission Electron Microscopy studies permitted determining nanoparticle size. Grain size of nanoparticle conglomerates was established via Atomic Force Microscopy. The magnetic behavior of ferrofluids was characterized by Vibrating Sample Magnetometer; and finally, a Magnetic Force Microscope was used to visualize the magnetic domains of nanoparticles. The mean size of the crystallite of nanoparticles determined by using the Scherrer approximation diminished when the Zn concentration increases. The size of the nanoparticles obtained by TEM is in good agreement with the crystallite size calculated from XRD measures. The magnetic properties investigated at room temperature presented super-paramagnetic behavior, determined by the shape of the hysteresis loop. Finally, our magnetic nanoparticles are considered a soft magnetic material.

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