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The effect of annealing temperature on structural, magnetic and dielectric properties of $PbFe_{11}Co_1O_{19}$ nanopartices

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Abstract: In this research, $PbFe_{11}Co_1O_{19}$ with annealing temperatures of 600, 700, 750, 800, 850 and 900 ˚C at annealing time of 3 h were synthesized by sol-gel method. The structural, microstructure properties and morphology of the samples have been studied by XRD, FT-IR and FESEM. Also, magnetic and dielectric properties of samples were characterized by VSM and LCR meter. The results of measurements of structural show that phase percentage of lead hexaferrite by increasing annealing temperature up to 800 ˚C increase and at annealing temperatures more than 800˚C percentage this phase decreases. The results of the magnetic measurements of samples reveal that by increasing annealing temperature and by eliminating the second phases, the saturation magnetization increases. Also, the results of dielectric reveal that by increasing frequency, dielectric constant and dielectric loss decreases which indicates that samples could be suitable for use in devices. The result measurements show that the best sample is $PbFe_{11}Co_1 O_{19}$ with annealing temperature of 800 °C and 3 h.

Keywords: *$PbFe_{11}Co_1O_{19}$ nanoparticles; Annealing temperature; Sol-Gel; Structural properties; Magnetic and dielectric properties.*

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