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PROCEEDINGS

Development of flexible magnetic films by the incorporation of Ni/Ni3C nanoparticles in a matrix of Amazonian tannic extract (Myrcia atramentifera).

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The development of nanostructured magnetic materials based on Ni and its compounds (Ni/Ni3C) has been the objective of scientific research due to the versatility of applications that these materials. In this context, magnetic films can be applied in a variety of technologies such as data storage, flexible spintronics, chemical detection, and magnetic sensors.[1] Additionally, the growing prospect of obtaining environmentally eco-friendly materials has promoted the use of vegetable matrices for film synthesis, such as tannins, for example. In this work, we report the fabrication of flexible magnetic films on paper substrates by adding Ni/Ni3C nanoparticles to the tannin extract matrix of the Amazonian species Myrcea atramentífera.[2] The tannin extract solution was obtained by processing the species' bark through grinding, sieving, and water extraction for 8 hours at 70°C, followed by filtration and concentration. After this step, a tannin extract suspension containing 0.1% Ni/Ni3C was prepared by dispersion in an ultrasonic processor. The suspension was dispersed onto a paper substrate and dried at 30 °C for 10 minutes. The films were characterized by XRD, SEM, AFM, and TGA/DSC measurements. The structural and morphological results indicate the formation of continuous films with dispersed nanoparticles. Thermal analysis results suggest that the nanoparticles dispersed in the films maintain structural stability up to 350 °C. The films present macroscopic magnetic response at room temperature, which can be attributed to the presence of nanoparticles with a coercive field of 100 Oe and saturation magnetization of 26 emu/g. [3]

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