

Coating cork particles with iron oxide: effect on magnetic properties

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Abstract- The main objective of this research is to develop a technique to obtain magnetic cork particles. The magnetization is achieved by applying a coating of iron oxides, obtained directly on the surface of cork particles from an acid solution of Fe cations added to a basic solution containing the particles. Previous surface treatment of cork particles was required; hence, plasma pretreatment was applied in a vacuum chamber to clean and activate the surface, enabling the coating process. Fourier transform infrared spectroscopy, X-ray diffraction, scanning electron microscopy, density and particle size were applied to characterize the cork and magnetic cork particles. In parallel, the magnetic character of particles was tested using magnets and by hysteresis cycles. All techniques have shown the presence of magnetite and maghemite on the cork surface. Results show cork particles adsorb between 17 and 27% of magnetite and maghemite, since by this process a mixture of both was obtained. These results are in accordance with density measurements. The magnetizing process is patented under Patent Numbers P201730993 and PCT/ES2018/070519.

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