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Synthesis, characterization and properties of magnetic colloids supported on chitosan.

Christian A. Cruzat[(1)*], G. Cárdenas[(1)], O. Peña[(2)] , J. Díaz V[(1)], M. Meléndrez[(1)]

(1) Polymers Departament, Advanced Materials Laboratory, Universidad de Concepción, 160-C, Chile.
(2) Sciences Chimiques de Rennes, UMR CNRS 6226, Université de Rennes 1, 35042 Rennes, France.

Abstract.-Nanoparticles of Fe, Co, Co(II,III), Ni and mixture Ni/Ag were synthesized for CLD method and their incorporation to chitosan for SMAD method and impregnation method. The size, solvent and concentration of magnetic colloids, are summarized in the table 1. The UV-spectra and LS data showed the agglomeration of nanoparticles along the time. The SQUID measurement for Co(II,III) oxide showed a paramagnetic behavior (fig. 2), similar to Co and Ni compounds. The diamagnetic support acquires importance with temperature increase.

The aim of this work was to investigate the capabilities of encapsulation and slow release of chitosan doped with magnetic nanoparticles for a possible use as magnetic drug carrier[1]. The use of magnetic particles nanometric causes changes in the physicochemical properties of these compounds. Fe, Co, Co(II,III), Ni and mixture Ni/Ag nanoparticles were synthesized by CLD method and the incorporation to chitosan matrix was performed by impregnation method and SMAD [2-3]. Polymeric matrix was obtained from shell of shrimp and its molecular weight was characterized by GPC. Colloids were characterized by UV spectra, FTIR, TEM, HRTEM and LS. Colloidal nanoparticles supported on chitosan were characterized by FTIR, TEM, SEM, SEM-F, TGA, EDX, SQUID and release tests were performed at pH 7.2. SQUID showed a paramagnetic behavior for Co, Co(II,III), Ni, and Ag-Ni compounds, in every temperature range. This behavior corresponds to superparamagnetic phenomena.

Table 1: Characterization of magnetic colloids.

Metal	Solvent	mM (metal)	Size (nm)
Fe	2-propanol	8.953	3.87
Co	2-propanol	8.484	25.82
Co(II,III)	2-propanol	8.484	37.68
Ni	2-propanol	8.485	7.98
Ag-Ni	2-propanol	5.995	58.47

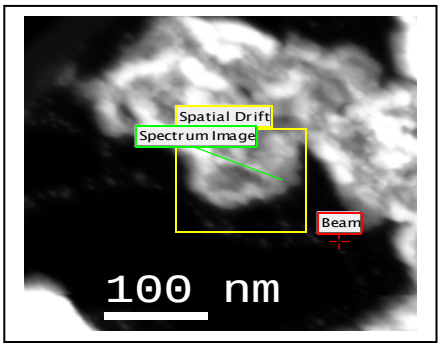

Figure 1: HRTEM of Ni-Ag Nps/2-propanol

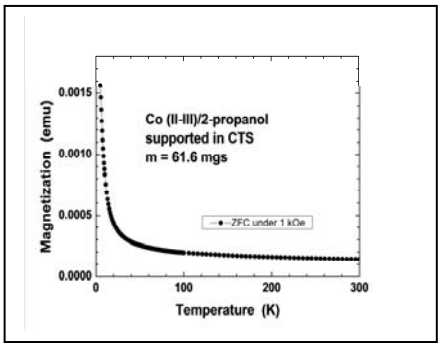

Figure 2: Magnetization/temperature curve nanoparticles of Co(II,III)/2-propanol.

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