

PREPARATION OF MAGNETIC POLYSTYRENE-DIVINYLBENZENE HYBRID NANOCOMPOSITES

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Hybrid nanocomposites consist of an organic (or inorganic) nanomaterial dispersed in a continuous inorganic (or organic) matrix. There is a growing interest on such nanocomposites[1], due to their enhanced properties derived from the synergistic contributions of the dispersed and the continuous components, that have found applications in high density storage media, sensors, optical filters, electronic materials, coatings, delivery systems and so on.

Herein, we present results on the preparation of rigid and transparent polystyrene-divinylbenzene (PS-DVB) transparent monoliths containing well dispersed magnetic iron oxide nanoparticles. The nanoparticles were synthesized using reverse microemulsions and were capped with a molecule which is compatible with the polymer matrix. Particulate and porous hybrid materials with characteristic dimensions in both the nano and micro scale have also been obtained via colloidal systems such as emulsions and high internal phase ratio emulsions (HIPREs)

References:

[1] A. C Balazs, T. Emrick, T.P. Russell, *Science* **314** (2006) 1107

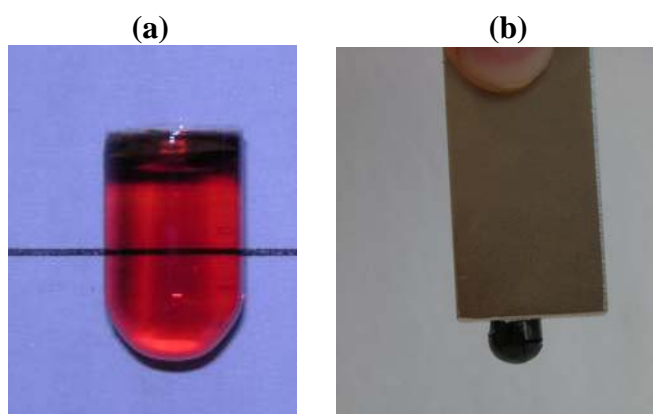


Figure 1: Images showing a PS-DVB monolith with low (a) and high (b) concentrations of embedded iron oxide nanoparticles. Note that the monolith is strongly attracted by a magnet in (b)

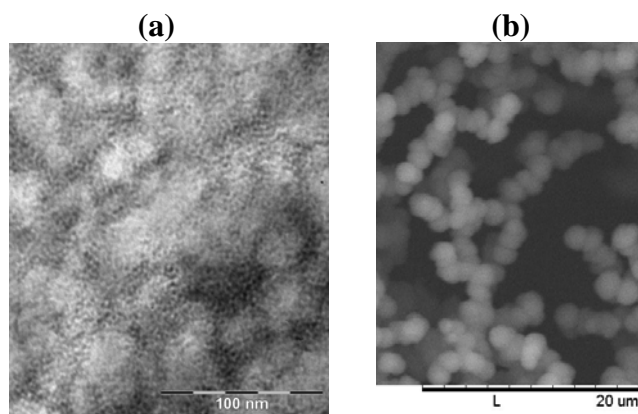


Figure 2: Microscopic images of iron oxide nanoparticles embedded in a PS-DVB matrix (a) and nanocomposite microparticles prepared using emulsions as templates (b)