

Contribution ID: 107

Type: Poster

Morphology control of PS-b-P4VP templated monolayer mesoporous Fe2O3 thin films

Wednesday 9 December 2020 17:40 (20 minutes)

Mesoporous Fe2O3 thin films with large area homogeneity demonstrate tremendous application potential in photovoltaic industry, lithium ion batteies, gas or magnetic sensors. In the present work, the synthesis of morphology-controlled Fe2O3 thin films is realized with the polystyrene-block-poly(4-vinylpyridine) (PS-b-P4VP) diblock copolymer assissted sol-gel chemistry. The effect of the solvent category and polymer-to-FeCl3 ratio is systematically investigated during the sol-gel synthesis process. For both DMF and 1,4-dioxane solvent symtem, nanosluster structures are obtained with low PS-b-P4VP concentration, which is supposed to be the result of the weak phase seperation property and thereby the weak template effect of the block polymer. When the concentration of the PS-b-P4VP reaches the critical point of micellization, spherical and wormlike porous structures can be specifically formed in the DMF and 1,4-dioxane solvent system, respectively. The further increase of the polymer-to-FeCl3 ratio lead to the enlargement of the spherical pore size in the DMF system and the shrink of center-to-center distance of the worm like structure in the 1,4-dioxane system.

Primary authors: MÜLLER-BUSCHBAUM, Peter (TU München, Physik-Department, LS Funktionelle Materialien); YIN, Shanshan

Presenter: YIN, Shanshan

Session Classification: Joint poster session of MLZ User Meeting and DN2020

Track Classification: UM: Soft Matter