

## Nanocomposites and nanomaterials

### Bridged polysilsesquioxane nanoparticles containing 3-mercaptopropyl groups in surface layer

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Bridged polysilsesquioxanes are hybrid organic-inorganic materials and have unique structure resulting with tunable chemical, physical and mechanical properties [1, 2]. In this work we considered the possibility to obtain mercapto-containing spherical particles based on the 1.2-bis(triethoxysilyl)ethane (BTESE) and 3-mercaptopropyltrimethoxysilane (MPTMS) using the modified Stober method. It is known that MPTMS forms spherical particles in an alkaline medium itself [3]. So, hydrolytic polycondensation reaction of alkoxy silanes was carried out in the presence of a fluoride-ion catalyst in an ethanol solution. The influence of various factors (ratio of reacting components, the amount of solvent and catalyst) on the morphology, particle size, content of SH-groups was studied.

The synthesized materials were investigated using IR spectroscopy, SEM, DLS analysis, element analysis, nitrogen adsorption-desorption. The obtained materials contain organic bridges and 3-mercaptopropyl functional groups introduced during synthesis. The prepared particles with 3-mercaptopropyl groups have low values of specific surface area unlike the particles with 3-aminopropyl groups. The obtained materials remove metal ions from the water solutions.

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