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High-yield synthesis of amido-functionalized polyoctahedral oligomeric silsesquioxanes by using acyl chlorides.

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Streszczenie

Homosubstituted amido-functionalized polyoctahedral oligomeric silsesquioxanes (POSS) have been synthesized by using acyl chlorides in high yields (ca. 95 %). The method proved to be superior over “conventional” syntheses applying carboxylic acids or acid anhydrides, which are much less efficient (ca. 60 % yield). A palette of aryl and alkyl groups has been used as side-chains. The structures of the resulting amide-POSS are supported by multinuclear ^{1}H, ^{13}C, ^{29}Si NMR and FTIR spectroscopy and their full conversion into octasubstituted derivatives was confirmed using mass spectrometry. We also demonstrate that the functionalized silsesquioxanes with bulky organic side-chains attached to cubic siloxane core form spherical-like, well-separated nanoparticles with a size of approximately 5 nm.

Słowa kluczowe

nanoparticles, nanostructures, organic-inorganic composities, solid-state structures, silicon

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