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ORGANOBORON DERIVATIVES OF STEREOREGULAR PHENYLCYCLOSILSESQUIOXANES

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Abstract
This paper presents the synthesis of organoboron derivatives of stereoregular 4-, 6-, and 12-unit phenylcyclosilsesquioxanes. All the compounds obtained were isolated in good yields (70-80%) and were fully characterized by ^{1}H, ^{13}C, ^{29}Si, ^{11}B NMR, IR spectroscopy, HRMS ESI, and elemental microanalysis. The structure of key modifier, obtained for the first time, 4-(tetramethyl-1,3,2-dioxaborolan-2-yl)phenyl) dimethylvinylsilane was also confirmed by single-crystal XRD.

In the past decade, there has been intense work in the field of synthesizing and studying the properties of new supramolecular systems.[1-4] This motivated by the desire to create new, unique materials with a given set of properties. The production of such materials became possible due to the development of modern physicochemical methods of analysis that allow one to accurately determine the structure of compounds and identify the "structure-property" relationship.[5]

Of the wide variety of existing supramolecular systems, three large classes can be distinguished that differ in the type of bonding: hydrogen-bonded organic frameworks (HOF),[6] covalent organic frameworks (COF)[7] and metal-organic frameworks (MOF).[8] Each of these supramolecular classes offers promise for various applications.[9-15] In this paper, we focus on the precursors for producing HOFs because such systems are capable of reversible structure reorganization, which allows one to obtain materials that are sensitive to external effects, which, in turn, is relevant for the creation of smart materials.[16,17]

The search for new chemical compounds exhibiting specific interactions is an important task. Its solution would allow one to obtain materials with specified physical properties that can and as starting compounds for synthesizing macromolecular scaffolds in Suzuki cross-coupling reactions.

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