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Squalene interactions with some hydrosilanes and hydrogermans

© **Dmitry A. Efimenko**,[1] **Irina B. Sokolskaya**,[1] **Evgeny N. Oficerov**,[2]*+
Antonida V. Kalistratova,[2] **Mihail M. Sibircev**,[1] **Vladislav Y. Kolesnikov**,[2]
Valentin G. Lahtin,[1]* and **Pavel A. Storozhenko**[1]
[1] *SSC RF JSC "GNIIChTEOS". Entuziastov Highway, 38. Moscow, 105118. Russia.*
Phone: +7 (495) 673-79-46. E-mail: vlachtin@rambler.ru
[2] *Department of Chemistry and Technology of Biomedical Preparations. Faculty of Chemical and Pharmaceutical Technologies and Biomedical Products. D. Mendeleev University of Chemical Technology of Russia. Miusskaya Sq. 9. Moscow, 125047. Russia. Phone: +7 (495) 978-32-61. E-mail: ofitser@mail.ru*

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*Supervising author; +Corresponding author

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Abstract

Squalene hydrosilylation by a number of organohydrosilanes R_3SiH and Me_3GeH, including a mixture of α- and β-isomers of adducts of vinyltrimethylsilane addition to tetramethyldisiloxane: $HSi(Me_2)O(Me_2)Si-C(Me)-SiMe_3$ and $HSi(Me_2)O(Me_2)Si-(CH_2)_2-SiMe_3$, formed both according to Markovnikov's rule and against it, is discussed. We pay attention to the mismatch of values between the electronegativities of carbon, silicon, germanium and hydrogen atoms and the reactivity of C-H, Si-H, and Ge-H bonds. A spectral study of a mixture of α- and β-isomers was carried out. The effect of substituents at elements on its reactivity is discussed: hydrosilanes with chlorine atoms, alkyl and alkoxy groups on silicon are not active in the squalene hydrosilylation. In contrast to them, the α- and β-adducts and their mixture add well to squalene with an unambiguously unknown regioselectivity. The results obtained indicate the special behavior of squalene in electrophilic addition reactions catalyzed by metal complexes, in contrast to substituted ethylenes.

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