

Stereochemistry of Disilanylene-containing Cyclic Compounds – Synthesis and Palladium-catalyzed Reactions of *cis*- and *trans*-3,4-Benzo-1,2-diisopropyl-1,2-dimethyl-1,2-disilacyclobut-3-ene

Akinobu Naka^a, Jun Sakata^a, Junnai Ikadai^b, Hiroyuki Kawasaki^a, Joji Ohshita^b, Eigo Miyazaki^b, Atsutaka Kunai^b, Kazunari Yoshizawa^c, and Mitsuo Ishikawa^a

^a Department of Life Science, Kurashiki University of Science and the Arts, Nishinoura, Tsurajima-cho, Kurashiki, Okayama 712-8505, Japan

^b Department of Applied Chemistry, Graduate School of Engineering, Hiroshima University, Higashi-Hiroshima 739-8527, Japan

^c Institute for Materials Chemistry and Engineering, Kyusyu University, Fukuoka 812-8581, Japan

Reprint requests to Prof. Akinobu Naka or Prof. Mitsuo Ishikawa.

E-mail: anaka@chem.kusa.ac.jp, ishikawa-m@zeus.eonet.ne.jp

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Dedicated to Professor Hubert Schmidbaur on the occasion of his 75th birthday

The synthesis and palladium-catalyzed reactions of *cis*- and *trans*-3,4-benzo-1,2-diisopropyl-1,2-dimethyl-1,2-disilacyclobut-3-ene (**1a** and **1b**) are reported. Their reactions with diphenylacetylene in the presence of a catalytic amount of tetrakis(triphenylphosphine)palladium(0) proceeded with high stereospecificity to give *cis*- and *trans*-5,6-benzo-1,4-diisopropyl-1,4-dimethyl-2,3-diphenyl-1,4-disilacyclohexa-2,5-diene, **2a** and **2b**, in 95 % and 93 % yield, respectively. Similar palladium-catalyzed reactions of **1a** and **1b** with monosubstituted acetylenes, such as 1-hexyne, *tert*-butylacetylene, phenylacetylene, and trimethylsilylacetylene, also proceeded stereospecifically to afford the respective *cis*- and *trans*-5,6-benzo-1,4-disilacyclohexa-2,5-dienes, **3a**–**6a** and **3b**–**6b**, in excellent yields and as the sole products. The palladium-catalyzed reaction of **1a** with styrene gave a mixture consisting of two stereoisomers, *cis*-2- and *trans*-2-phenyl-substituted 5,6-benzo-(*r*-1),*cis*-4-diisopropyl-1,4-disilacyclohex-5-ene **7a** and **8a** in a ratio of 5 : 3 in 72 % combined yield, while the reaction of styrene with **1b** afforded two stereoisomers, **7b** and **8b**, in a ratio of 2 : 1 in 80 % combined yield. With 1-hexene, **1a** gave two stereoisomers, 5,6-benzo-*cis*-2-(*n*-butyl)-(*r*-1),*cis*-4-diisopropyl- and 5,6-benzo-*trans*-2-(*n*-butyl)-(*r*-1),*cis*-4-diisopropyl-1,4-dimethyl-1,4-disilacyclohex-5-ene, **9a** and **10a**, in a ratio of 1 : 1 in 70 % combined yield. A similar reaction of **1b** with 1-hexene produced 5,6-benzo-*cis*-2-(*n*-butyl)-(*r*-1),*trans*-4-diisopropyl-1,4-dimethyl-1,4-disilacyclohex-5-ene in 81 % yield and as a single isomer.

Key words: Stereochemistry, Palladium-catalyzed Reaction, Disilanyl Compounds, Benzodisilacyclobutenes