

**Название публикации:**

Cu<sub>42</sub>Ge<sub>24</sub>Na<sub>4</sub>-A Giant Trimetallic Sesquioxane Cage: Synthesis, Structure, and Catalytic Activity

**Авторы:**

Kulakova, AN [ 1,2 ] ; Bilyachenko, AN [ 1,2 ] ; Khrustalev, VN [ 2,3 ] ; Zubavichus, YV [ 3 ] ; Dorovatovskii, PV [ 3 ] ; Shul'pina, LS [ 1 ] ; Bantreil, X [ 4 ] ; Lamaty, F [ 4 ] ; Shubina, ES [ 1 ] ; Levitsky, MM [ 1 ] ; Shul'pin, GB [ 5,6 ]

[ 1 ] Russian Acad Sci, AN Nesmeyanov Inst Organoelement Cpds, Ul Vavilova 28, Moscow 119991, Russia

[ 2 ] Peoples Friendship Univ Russia, Ul Miklukho Maklaya, Dom 6, Moscow 117198, Russia

[ 3 ] Kurchatov Inst, Natl Res Ctr, Pl Akad Kurchatova, Dom 1, Moscow 123182, Russia

[ 4 ] Univ Montpellier, CNRS, UMR 5247, IBMM, ENSCM, Univ Montpellier Campus Triolet Pl Eugene Bataill, F-34095 Montpellier 5, France

[ 5 ] Russian Acad Sci, Semenov Inst Chem Phys, Dom 4, Moscow 119991, Russia

[ 6 ] Plekhanov Russian Univ Econ, Chair Chem & Phys, Dom 36, Moscow 117997, Russia

**Наименование журнала:**

CATALYSTS

**Аннотация:**

Unprecedented germanium-based sesquioxane exhibits an extremely high nuclearity (Cu<sub>42</sub>Ge<sub>24</sub>Na<sub>4</sub>) and unusual encapsulation features. The compound demonstrated a high catalytic activity in the oxidative amidation of alcohols, with cost-effective catalyst loading down to 400 ppm of copper, and in the oxidation of cyclohexane and other alkanes with H<sub>2</sub>O<sub>2</sub> in acetonitrile in the presence of nitric acid. Selectivity parameters and the mode of dependence of initial cyclohexane oxidation rate on initial concentration of the hydrocarbon indicate that the reaction occurs with the participation of hydroxyl radicals and alkyl hydroperoxides are formed as the main primary product. Alcohols have been transformed into the corresponding ketones by the catalytic oxidation with tert-butyl hydroperoxide.

**Ключевые слова:**

alkanes; amides; hydrogen peroxide; multinuclear complexes; iron complexes; metallasiloxanes