Название публикации:

Cu42 Ge24 Na4 —a giant trimetallic sesquioxane cage: Synthesis, structure, and catalytic activity

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Наименование журнала:

Catalysts
Volume 8, Issue 10, 22 October 2018, Номер статьи 484

Аннотация:

Unprecedented germanium-based sesquioxane exhibits an extremely high nuclearity (Cu42 Ge24 Na4) 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 H2 O2 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 peroxideIron complexes, Metallasiloxanes, Multinuclear complexes