

Название публикации:

Heptanuclear Fe₅Cu₂-Phenylgermsesquioxane containing 2,2'-Bipyridine: Synthesis, Structure, and Catalytic Activity in Oxidation of C-H Compounds

Авторы:

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

[1] Russian Acad Sci, Nesmeyanov Inst Organoelement Cpds, Vavilov Str 28, Moscow 119991, Russia

[2] Peoples Friendship Univ Russia RUDN Univ, Miklukho Maklay Str 6, Moscow 117198, Russia

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

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

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

[6] Plekhanov Russian Univ Econ, Dom 36, Moscow 117997, Russia

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Аннотация:

A new representative of an unusual family of metallagermaniumsесquioxanes, namely the heterometallic cage-like phenylgermsesquioxane (PhGeO₂)(₁₂)Cu₂Fe₃(O)OH-(PhGe)(₂)O-5(bipy)(₂) (2), was synthesized and structurally characterized. Fe(III) ions of the complex are coordinated by oxa ligands: (i) cyclic (PhGeO₂)(₁₂) and acyclic (Ph₂Ge₂O₅) germoxanulates and (ii) O²⁻- and (iii) HO- moieties. In turn, Cu(II) ions are coordinated by both oxa (germoxanulates) and aza ligands (2,2'-bipyridines). This "hetero-type" of ligation gives in sum an attractive pagoda-like molecular architecture of the complex 2. Product 2 showed a high catalytic activity in the oxidation of alkanes to the corresponding alkyl hydroperoxides (in yields up to 30%) and alcohols (in yields up to 100%) and in the oxidative formation of benzamides from alcohols (catalyst loading down to 0.4 mol % in Cu/Fe).

Ключевые слова:

Cluster organic frameworks; metal-metal cooperativity; fischer-tropsch synthesis; copper(ii) silsesquioxanes; alkane oxidation; benzyl alcohols; borylation; peroxides; amidation; cages