Two supramolecular inorganic-organic hybrids of 12-silicotungstic acid heteropolyoxometalate and trinuclear lanthanide clusters: syntheses, structures, and magnetic properties.

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Streszczenie

Hydrothermal synthesis of two novel inorganic–organic hybrid assemblies, $\{Na[Ln(pydc\text{-}OH)(H_2O)_4]_3\}[SiW_{12}O_{40}]\cdot 15H_2O$ [Ln = Nd (**1**) and Ln = Sm, (**2**); pydc-OH = 4-hydroxypyridine-2,6-dicarboxy], and their characterization is described. Structural characterizations by single-crystal X-ray diffraction reveal that these compounds are isostructural, and each consists of $[SiW_{12}O_{40}]^{4-}$Keggin-type polyoxometalates (POMs) linked by three lanthanide ions to yield discrete trinuclear lanthanide clusters. These discrete molecules are further packed into 3D supramolecular assemblies by means of hydrogen-bonding and anion–π interactions. Both compounds exhibit remarkable thermal stability. The temperature variation in the magnetic susceptibility χ_m and of the $\chi_m T$ product and Bohr magnetons of the Nd^{III} (**1**)- and Sm^{III} (**2**)-based compounds are considered. The magnetic data have been interpreted relative to data presented in the literature.

Słowa kluczowe

Supramolecular chemistry, Polyoxometalates, Hydrothermal synthesis, lanthanides, magnetic properties

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