Two Organic Hybrid Thiogermanates $[\text{Ni(dien)}_2]_2(\text{H}_2\text{dien})\text{Ge}_2\text{S}_6$ and $[\text{Ni(teta)}_2]_2\text{Ge}_4\text{S}_{10}$

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Two new organic hybrid thiogermanates $[\text{Ni(dien)}_2](\text{H}_2\text{dien})\text{Ge}_2\text{S}_6$ (1, dien = diethylenetriamine) and $[\text{Ni(teta)}_2]_2\text{Ge}_4\text{S}_{10}$ (2, teta = triethylenetetramine) were synthesized under solvothermal conditions. 1 contains a $[\text{Ni(dien)}_2]^{2+}$ complex cation, a protonated dien molecule and a $[\text{Ge}_2\text{S}_6]^{4-}$ dimeric anion, while 2 consists of discrete $[\text{Ge}_4\text{S}_{10}]^{4-}$ adamantane-like cluster anions with $[\text{Ni(teta)}_2]^{2+}$ complex cations as counter ions. The $[\text{Ge}_4\text{S}_{10}]^{4-}$ anion is composed of four nearly tetrahedral Ge$^{4+}$ centers to which are bonded four terminal atoms and six bridging S atoms. Luminescence studies have shown that 2 exhibits an emission at 468 nm.

Key words: Thiogermanates, Solvothermal Syntheses, Crystal Structures, Complex Cation, Nickel