

Ca²⁺-driven self-assembly of POMs into 2D/3D coordination polymers.

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A number of new POM-based coordination polymers, including two-dimensional (NH₄)₄{[Ca(H₂O)₅][P₂Mo₅O₂₃]}·3H₂O (**4**) (bpy = 2,2'-bipyridine), and a rare anion-based (NH₄)₅[Co^{III}(bpy)₃]{[Ca(H₂O)₄]₂[Ca(H₂O)]₆[PMo₆O₂₂(PO₄)₃]₂}·17H₂O (**3**), as well as three-dimensional (NH₄)₈[Co^{III}(bpy)₃]₂{[Ca(H₂O)₃]₂[P₂Mo₅O₂₃]₃}·21H₂O (**2**) have been prepared using a facile wet-chemistry approach and have been characterized by X-ray diffraction analysis and a variety of physicochemical methods. The self-assembly in the above compounds has been rendered by the use of Ca²⁺ ions as a suitable linker in the network formation. Moreover, Ca²⁺ ions were also involved in the formation of an extremely rare type of POM anion {[Ca(H₂O)]₆[PMo₆O₂₂(PO₄)₃]₂}¹²⁻. The synthesis attempt without the alkaline-earth metal led, predictably, to the formation of the discrete Strandberg-based compound (NH₄)₃[Co^{III}(bpy)₃][P₂Mo₅O₂₃]·14H₂O (**1**). Thus, the present work reports on a suitable strategy to influence complex POM-based systems towards self-organization into multidimensional structures of higher hierarchy. The obtained compounds have been shown to possess electrocatalytic activity towards the reduction of iodates(V).

Słowa kluczowe

Polyoxometalates, coordination polymers, electrochemistry, electrocatalytic activity, calcium

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