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α–Phase organic/inorganic layered nanohybrids, types, structures and their application as the precursors for producing carbon materials for use as polymeric fuel cell cathode materials

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Abstract

The α–phase metal hydroxides are layered materials with positively charged layers formed solely with divalent cations in the brucite-like structure. These layered hydroxides are important materials owing to their ability to intercalate various organic/inorganic functional anions to produce layer by layer nanohybrids. This leads to the production of the materials with new physico-chemical properties when combined with the appropriate guest species to be used in diverse technological applications. Moreover, α–phase layered hydroxides and their nanohybrids are suitable precursors to obtain two-dimensional nanostructures of pure and doped metal oxides, metallic alloys, carbon materials as well as metal oxide/carbon composites.

This present deals with a short description of structures, properties and applications of α–phase metal hydroxides and their nanohybrids. Moreover, in particular, carbon materials produced by heat-treatment of an organic/inorganic nanohybrid, namely Ni/Co/Fe doped zinc hydroxide-nitro benzoate to be used as polymeric fuel cell cathode materials is addressed here.