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Multifunctional layered double hydroxides


Layered Double Hydroxides (LDHs) are composed of the alternating positively-charged mixed metal (typically, MII-MIII) hydroxide layers and the interlayers occupied by anions and water molecules. The metal cations in the layers are coordinated by O-H units forming 2D structures in which the oxygen octahedra are edge-linked. LDHs find a wide use in catalysis and as anion exchangers and adsorbents. Magnetic, luminescent and others) cations in the hydroxide layer due to their individual or cooperative phenomena can induce new effects and novel functionalities in these materials. The characteristic feature of such modified LDHs is that their physical and chemical properties are tuned by means of continuous variation of the anion content in the interlayer. Moreover, provided that at least one of MII and MIII is magnetic, a MII-MIII cation ordering can result in formation of various magnetic frameworks. In this respect, LDHs are convenient and unique objects for the experimental modelling of the 2D quantum magnets and other cooperative effects. Because of the layered nature, the LDH

crystallites are very anisotropic. Therefore, such objects are suitable for formation of arranged nanostructures. An ability of LDHs to intercalate anion-molecular complexes offers also the opportunity for a 2D arrangement of the species which are the independent functional units such as magnets, ferroelectrics, photovoltaics. Ordered arrangement of the functional units in interlayer are expected to result in enhancement of the respective effects and even to induce new effects.

Speaker Biography

Andrei N Salak completed his PhD in 1994 at the Institute of Solid State and Semiconductor Physics (Minsk, Belarus). In 2002, he received a post-doctoral position in CICECO - Centre for Research in Ceramics and Composite Materials at the University of Aveiro (Aveiro, Portugal). At present, he is an Invited Researcher at CICECO. He specializes in crystal structure determination and characterization dielectric and magnetic properties of inorganic solids, particularly perovskite-like materials and layered ion exchangers. He is a co-author of more than 100 papers in international peer-reviewed journals with over 1200 citations.

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