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A new heterometallic heptanuclear $[K_4ICr_3III]$ hybrid material: Synthesis, characterization and magnetic properties

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Nowadays, one of the most intensive investigation subject in field of materials science is organic-inorganic salts(OIHSs) of owing to their intriguing aesthetic structures and their numerous potential applications as poly-functional materials [1]. With respect to the very large number of homometallic oxalatometalate(III) salts, the heterometal oxalato-bridged complexes have been much less explored, given the difficulty in controlling the resulting heterometallic arrays[2]. Well-known examples are the 2-D MOFs formulated as $(A)[MII/IMIII(ox)_3]2-/1-$ that have been extensively investigated as molecular magnets[3]. Therefore, our interest in this field is a fundamental requirement for gaining some insight into the structural features and the magnetic trend associated with heteropolynuclear oxalato-bridged complexes containing pyridinium derivatives as counter cations. A new heteroheptanuclear oxalato-bridged $[K_4ICr_3III]$ hybrid salt, $(C_6H_9N_2)_3[K_4Cr_3(C_2O_4)_8(H_2O)_2,5] (1)$ ($C_6H_9N_2^+ = 2\text{-amino-3-methylpyridinium cation}$) has been synthesized using methatesis reaction strategy. It has been characterized by elemental and thermal analyses, IR spectroscopy, single-crystal X-ray diffraction, EPR and variable temperature magnetic susceptibility measurements.

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