

First exfoliated Ru-Ru-Au organometallic polymer with layered structure

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A new water soluble heterometallic polymeric complex

$[\{(PTA)_2CpRu-\mu-CN-1\mu C:2\mu 2N-RuCp(PTA)_2\}-\mu-\{Au(CN)_4\}_4]_n \cdot 2H_2O$ (1) is synthesized and characterized by single crystal X-ray diffraction. This complex self-assembles forming 3D polymeric structures with large scale hexagonal conformation. They also organize as 3D stacks of polymer sandwiches that can be exfoliated providing mono heterometallic-3D layers, as shown by electron microscopy. Regarding the polymer dynamics, quasi-elastic neutron scattering shows a transition from vibrational Debye-Waller behaviour to a more dynamically active state as a result of the loss of structural water molecules.