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Magnetic Superatom Assemblies and their Transport Properties[1] LIN ZHU, J. ULISES REVELES, V. MENDEL, A. REBER, SHIV KHANNA, Department of Physics, Virginia Commonwealth University — We had recently shown that magnetic superatoms can be formed by embedding 3d transition metal atoms in metallic clusters of otherwise non-magnetic elements. The hybridization between the localized exchange split atomic orbitals in 3d elements with superatomic orbitals can help stabilize the magnetic state. Through first principles studies on the electronic structure and magnetic moment of Mg_nTM (TM = Sc, Ti, V, Cr, Mn, Fe, Co, and Ni) clusters, we had identified Mg_8Fe to be a stable magnetic superatom. In this work, we will present our investigations on the magnetic properties of the assemblies of such superatoms and the nature of electronic transport through such assemblies with various electrodes. The effects of the contact geometry and gate voltage on the conductance are also studied.

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