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Electronic transport in Graphene doped with Single Molecule Magnets SIMA SAEIDI VARNOOSFADERANI, ADELINE FOURNET, ANNALIESE THUIJS, GEORGE CHRISTOU, ARTHUR HEBARD, University of Florida — We report on the interaction of monolayer graphene with Manganese-based single molecule magnets (SMMs) with various ligands. There is a linear relationship between density of states and energy in graphene. So unlike other metals, the density of states is very small near the Fermi energy in graphene and it can be easily modulated via doping. We combine the characterization techniques of Raman spectroscopy and atomic force microscopy with transport measurement to investigate the charge transfer and change in the electronic and magnetic properties of graphene after doping with this first discovered family of SMMs [Mn_{12} O_{12} $(O_2CR)_{16}$ $(H_2O)_4$]. Transport measurements show that doping graphene with these magnetic molecules will transfer charge (electrons) from graphene to the molecules and decrease the graphene sheet's resistance and mobility. Magnetoresistance data has been taken to confirm the reduction in the mobility attributed to an increased density of charge impurity scattering centers by doping.

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