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Comparison of contact methods for molecular magnetic tunnel junctions BRIAN RUDERMAN, PATRICK TRUITT, Montclair State University — Self-assembled monolayers (SAMs) have potential application in charge and spin transport devices. A variety of techniques have been established for contacting SAMs with normal metal electrodes for charge transport studies. However, many of these techniques limit the types of SAMs that can be used or are incompatible with ferromagnetic (FM) electrode materials needed for spin transport. We discuss two methods that are promising for observing spin transport in SAMs. In the first method, we deposit FM electrodes on various sacrificial layers, and then transfer the electrodes to a PDMS stamp which can then be gently brought into contact with the SAM. In the second method, we float a layer of graphene on an aqueous surface and bring it into contact with the monolayer; the graphene acts as a barrier that protects the SAM during subsequent deposition of the FM electrode. Using the latter method, we have been able to fabricate non-shorting, molecular tunnel junctions with magnetic electrodes and current densities consistent with transport through an alkane SAM. We will present our findings on the yield and quality of both fabrication methods, as well as our progress towards functioning molecular spintronic devices.

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