

Abstract Submitted
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Spin transport studies in high mobility organic semiconductor, Pentacene ($C_{22}H_{14}$) J.H. SHIM, V. KARTHIK, J.S. MOODERA, MIT, MIT TEAM — Spin transport in organic semiconductors (OSs) is currently an attractive research area because these materials in general can have long spin coherence length due to weak spin-orbit scattering and hyperfine interaction. Charge and spin transport in OSs strongly depend on the intermolecular overlap of electronic wave functions and defects in OS which can be influenced by the thin film growth conditions. Here we chose OS, pentacene ($C_{22}H_{14}$), which is among the most promising materials due to its high mobility. From the measured temperature dependence of the conductance in Al/Pentacene/Co thin film tunnel junctions, different transport mechanisms were observed for pentacene barriers of various thicknesses. Thin, amorphous pentacene films were deposited with and without Al_2O_3 seed layer at room temperature. Significant tunnel magnetoresistance (TMR) was observed at room temperature in junctions with Co and Fe electrodes and pentacene tunnel barrier. These results will be presented and discussed. Research supported by ONR and KIST-MIT programs.

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