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**Regioregular polythiophene based spintronic devices: effect of interface**[1] RONALD OSTERBACKA, Abo Akademi University, SAYANI MAJUMDAR, Abo Akademi University and University of Turku, HIMADRI MAJUMDAR, Abo Akademi University, REINO LAIHO, PEKKA LAUKKANEN, University of Turku, JUHANI VAYRYNEN, juhani.vayrynen@utu.fi — Polymeric spin valves have been fabricated using regio-regular (poly 3-hexylthiophene) (RRP3HT) as the spacer layer sandwiched between $La_{0.67}Sr_{0.33}MnO_3$ (LSMO) and Co electrodes. The devices show high spin valve magnetoresistance (MR) at 5K (80%) which reduces at room temperature to 1.5%. The spin valve behavior is quite similar to a magnetic tunnel junction although the non-magnetic spacer layer ($\sim$100 nm) is much thicker than the tunneling limit. We attribute this behavior to the formation of a thin spin-selective tunneling interface between LSMO and RRP3HT caused by the chemical bonding between RRP3HT and LSMO as observed by x-ray photoelectron spectroscopy measurement. Deliberate destruction of the spin injecting interface by the introduction of a monolayer of organic insulators between LSMO and RRP3HT reduces the spin injection.

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