

Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Sorting Category: 10.1.7 (E)

The effect on the properties of V(TCNE) grown on bare substrates and self assembled monolayers MEGAN HARBERTS, HOWARD YU, MARK GUSEMAN, Department of Physics, The Ohio State University, YU LU, Department of Chemistry, The Ohio State University, EZEKIAL JOHNSTON-HALPERIN, Department of Physics, The Ohio State University, ARTHUR EPSTEIN, Departments of Chemistry and Physics, The Ohio State University — V(TCNE) is a room temperature Tc larger than 400K organic based magnetic semiconductor. It has been shown that this fully-spin polarized material can be used as a spin injector in hybrid organic inorganic spin-light emitting diode (spin-LED) as well as hybrid and all organic spin valves [1,2]. Attempts to improve the spin signal from a spin LED device are focusing on surface passivation of the III-V heterostructure surface by including a self-assembled monolayer (SAM). We present a comparison of the properties of V(TCNE)grown by chemical vapor deposition (CVD) on various SAM's and bare substrates. We find that the successful growth of uniform, thin films of CVD V(TCNE) requires careful purification of the SAM precursors. We observe bulk magnetic properties of V(TCNE) grown on SAM's to be consistent with or better than films grown on bare substrates. Therefore the presence of the SAM does not appear to adversely affect the desired properties of the V(TCNE) for use as a spin injector, dramatically expanding the range of potential hybrid device geometries.

[1] L. Fang, Phys Rev Lett, 106 (15), (2011).

[2] J. W. Yoo, Nat Mater, 9 (2010).

- Prefer Oral Session
 Prefer Poster Session

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Date submitted: 13 Dec 2011

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