Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Electron Spin Relaxation in Hole Polaron States of Conjugated Porphyrin Arrays PAUL J. ANGIOLILLO, Saint Joseph's University, PAUL R. FRAIL, University of Pennsylvania, NORA GRANETO, DEVLIN MURDOCK, Saint Joseph's University, MICHAEL J. THERIEN, University of Pennsylvania
— It has been previously demonstrated that stable hole-polaron states may be produced in a family of highly π-conjugated (porphinato)Zn(II) in which the monomeric units are bridged by ethyne linkages. Furthermore, EPR results verify that hole delocalization or incoherent hopping occur over substantial distances ($\sim$ 7.5 nm) along a single conjugated backbone. The electron spin relaxation times in traditional conducting materials are on the order of picoseconds. Preliminary data gleaned from progressive microwave saturation will show that electron spin relaxation times in these materials are on the order of 1μs at 298 K in both solution and in film architectures and moreover are relatively insensitive to oligomer length with distances spanning 1.4 to 7.5 nm. Since hopping rates have been observed to be on the order of 10^{+7} Hz, it is possible then for spin memory of the hole polaron to be retained during its migratory process.

Paul Angiolillo
Saint Joseph's University

Date submitted: 22 Nov 2006 Electronic form version 1.4