

Abstract Submitted
for the MAR15 Meeting of
The American Physical Society

Electron relaxation of DNP free radicals BDPA and DPPH at W-band ARMIN KHAMOSHI, UT Dallas, PAVANJEET KAUR, LIKAI SONG, NHMFL, LLOYD LUMATA, UT Dallas — The stable, spin-1/2 organic free radicals BDPA and DPPH are efficient polarizing agents for dissolution dynamic nuclear polarization (DNP). Despite the hydrophobic nature of these two free radicals, BDPA and DPPH can be dissolved in specialized solvents such as sulfolane or dimethyl sulfoxide. In this work, we have investigated the temperature dependence of the spin-lattice relaxation rate $1/T_1$ of these two DNP free radicals at W-band from 250 K down to 4 K. We have found that at high temperature above 40 K the relaxation rates of these free radicals (at optimum DNP concentration) behave closely according to the Raman process prediction. At lower temperature below 40 K, the relaxation rate slows down according to the direct process behavior. The results obtained here may elucidate the correlation between the relaxation of electrons and the efficiency of these free radicals in DNP.

Armin Khamoshi
UT Dallas

Date submitted: 05 Jan 2015

Electronic form version 1.4