Abstract Submitted
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The stability and reactivity of the DNP-NMR polarizing agents galvinoxyl, DPPH, 4-oxo-TEMPO, and trityl OX063[1] LUKE JEREMIAH DAVIS, PETER NIEDBALSKI, LLOYD LUMATA, Univ of Texas, Dallas — The organic free radicals galvinoxyl, DPPH, 4-oxo-TEMPO, and trityl OX063 are efficient polarizing agents used for fast dissolution dynamic nuclear polarization (DNP) NMR spectroscopy. In this study, ultraviolet-visible (UV-Vis) spectroscopy was used to estimate the molecular stability of these free radicals with respect to time, across varying temperatures, and in the setting of the naturally-occurring antioxidants glutathione or ascorbic acid. ESR spectroscopy was then used to investigate the degree of reactivity of each polarizing agent in the setting of various concentrations of either glutathione or ascorbic acid. Our time-dependent UV-Vis results show slight degradation of the π-conjugated system of galvinoxyl but, otherwise, no appreciable decay of the other molecules' conjugated system(s) or functional group(s). Overall, these results and other relevant findings of this study supplement prior research on these polarizing agents and may thereby facilitate further optimization of DNP-NMR bioimaging.

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