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Impact of Gd^{3+} doping and glassing solvent deuteration on ^{13}C DNP at 5 Tesla[1] ANDHIKA KISWANDHI, Univ of Texas, Dallas, BIMALA LAMA, AMRIS/NHMFL, Univ of Florida, PETER NIEDBALSKI, MUDREKH GODERYA, Univ of Texas, Dallas, JOANNA LONG, AMRIS/NHMFL, Univ of Florida, LLOYD LUMATA, Univ of Texas, Dallas — Dynamic nuclear polarization (DNP) is a technique which can be used to amplify signals in nuclear magnetic resonance (NMR) and magnetic resonance imaging (MRI) by several thousand-fold. The most commonly available DNP system typically operates at the W-band field or 3.35 T, at which it has been shown that ^{13}C NMR signal can be enhanced by deuteration and Gd^{3+} doping. In this work, we have investigated the applicability of these procedures at 5 T. Our results indicate that the deuteration of the glassing matrix still yields an enhancement of ^{13}C DNP when 4-oxo-TEMPO free radical is used. The effect is attributed to the lower heat load of the deuterons compared to protons. An addition of a trace amount of Gd^{3+} gives a modest enhancement of the signal when trityl OX063 is used, albeit with a less pronounced relative enhancement compared to the results obtained at 3.35 T. The results suggest that the enhancement obtained via Gd^{3+} doping may become saturated at higher field. These results will be discussed using a thermodynamic model of DNP.

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