Abstract Submitted
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Optimization of 13C dynamic nuclear polarization at 5 Tesla[1] ANDHIKA KISWANDHI, Univ of Texas, Dallas, LAMA BIMALA, AMRIS/NHMFL, University of Florida, PETER NIEDBALSKI, MUDREKH GODERYA, Univ of Texas, Dallas, JOANNA LONG, AMRIS/NHMFL, University of Florida, LLOYD LUMATA, Univ of Texas, Dallas — Dissolution dynamic nuclear polarization (DNP) is a physics-based technique that amplifies the magnetic resonance spectroscopy (MRS) and imaging (MRI) signals by several thousand-fold. In this work, we have investigated two optimization methods for preparing ^{13}C DNP samples (glassing matrix deuteration and Gd^{3+} doping) at B = 5 T. Normally, these optimization methods work favorably at W-band field or 3.35 T. At 5 T, deuteration of the glassing matrix still results in an improvement of the ^{13}C DNP when 4-oxo-TEMPO free radical is used. This effect can be attributed to the lower heat load of the deuterons than protons. An addition of trace amount of Gd^{3+} is still relatively beneficial in enhancing the polarization when trityl OX063 free radical is used, albeit with a less pronounced improvement compared to the results at B = 3.35 T. This suggests that the signal enhancement due to the addition of Gd^{3+} can become saturated at high field. These results will be discussed using a thermodynamic model of DNP.

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