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Temperature-dependent proton T1 relaxation time of water:glycerol solutions at earth's magnetic field[1] FATEMEH KHASHAMI, QING WANG, PETER NIEDBALSKI, LLOYD LUMATA, University of Texas at Dallas — Although weak, the earth's magnetic field is highly uniform which is required for high-resolution nuclear magnetic resonance (NMR) spectroscopy. In this study, we have investigated the spin-lattice relaxation time (T1) of water-glycerol mixtures at earth's magnetic field. The water proton T1s at different ratios of water-glycerol contents were measured at different temperatures ranging from -20 deg C to 100 deg C. Our results indicate that pure water proton T1 increases linearly with temperature, from ˜2 s at 20 deg C to ˜8 s at 100 deg C. However, addition of high glycerol content in this mixture decreases the slope of this linear relationship and in fact disrupts the linearity of this behavior at low temperature. A slight turnover of the T1 slope occurs at lower temperature close to 20 deg which is indicative of the effect of changing correlation time. These results are discussed in light of the Bloembergen-Pound-Purcell (BPP) theory.

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Fatemeh Khashami
University of Texas at Dallas

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