Abstract Submitted
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Real-time spectroscopic detection of yttrium ion and ligand binding via hyperpolarized ^{89}Y NMR SARAH FERGUSON, ANDHIKA KISWANDHI, University of Texas at Dallas, ZOLTAN KOVACS, University of Texas Southwestern Medical Center, LLOYD LUMATA, University of Texas at Dallas — The physics-based technology fast dissolution dynamic nuclear polarization (DNP) can be used to enhance the signal strength in nuclear magnetic resonance (NMR) and imaging (MRI) experiments for nuclear spins with low gyromagnetic ratio such as yttrium-89. One of the most common and stable MRI contrast agents used in the clinic is Gd-DOTA. In this study, we have investigated the binding of the yttrium and DOTA ligand as a model for complexation of Gd ion and DOTA ligand. The macrocyclic ligand DOTA is special because its complexation with lanthanide ions such as Gd^{3+} or Y^{3+} is highly pH dependent. Using this physics technology, we have tracked the complexation kinetics of hyperpolarized Y-triflate and DOTA ligand in real-time and detected the Y-DOTA intermediates. Different kinds of buffers were used (lactate, acetate, citrate, oxalate) and the pseudo-first order complexation kinetic calculations will be discussed.

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