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Hyperpolarized Krypton-83 as a MRI Contrast Agent ZACKARY CLEVELAND, GALINA PAVLOVSKAYA, KARL STUPIC, Colorado State University, JOHN REPINE, Webb-Waring Institute, THOMAS MEERSMANN, Colorado State Univeristy — Hyperpolarized krypton-83 (I = 9/2) yields NMR signal enhancements [1] of 1200 to 4500 times that of thermal equilibrium value depending on the composition of the optical pumping gas mixture. The quadrupolar relaxation of krypton-83 provides surface sensitive contrast in MRI [2] and yields information about surface hydrophobicity [3], surface-to-volume ratio, surface temperature, and surface hydration. These characteristics make hp krypton-83 MRI a promising technique for materials science applications and medical diagnosis. Experimental hp krypton-83 results in model systems with biomedically relevant coatings (e.g. lung surfactant and cigarette tar) are presented. Additionally, preliminary results from hp krypton-83 in excised rodent lungs are discussed. (1) ZI Cleveland, et al., Chem. Phys., 2006. 124(4) 044311. (2) GE Pavlovskaya, et al., Proc. Natl. Acad. Sci. U.S.A.,2005. 102: 18275-18279. (3) KF Stupic, et al., Solid State Nucl. Magn. Reson., 2006. 29: 79-84.

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