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Hyperpolarized Long-T_1 Silicon Nanoparticles for Magnetic Resonance Imaging[1] MAJA CASSIDY, SEAS, Harvard University, MA, JACOB APTEKAR, ALEXANDER JOHNSON, ROBERT BARTON, MENYOUNG LEE, ALEXANDER OGIER, CHINH VO, Department of Physics, Harvard University, MA, CHANDRASEKHAR RAMANATHAN, DAVID CORY, Department of Nuclear Science and Engineering, MIT, MA, ALISON HILL, ROSS MAIR, MATTHEW ROSEN, RONALD WALSWORTH, Harvard-Smithsonian CfA, MA , CHARLES MARCUS, Department of Physics, Harvard University, MA — Nanoparticles are currently being widely investigated as targetable contrast agents for magnetic resonance imaging (MRI). Silicon is a promising material system for use as a magnetic resonance imaging agent due to its long bulk (T_1) times and receptivity to hyperpolarization. We present studies of the nuclear relaxation (T_1) times of silicon nanoparticles as a function of particle size, dopant concentration and fabrication method. The T_1 times of these particles are found to be remarkably long (depending on size and dopant concentration), allowing for them to be transported and administered on practical time scales. In addition, we discuss the particles' receptivity to hyperpolarization, via low temperature microwave induced dynamic nuclear polarization.

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