Abstract Submitted
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Room temperature ferromagnetic Gd_5Si_4 nanoparticles as T2 contrast agents for MRI.[1] AHMED EL-GENDY, SHANE HARSTAD, Department of Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, 23284, SHALABH GUPTA, VITALIJ PECHARSKY, Division of Materials Science and Engineering, Ames Laboratory, US Dept. of Energy, Ames, IA 50011, VIMALAN VIJAYARAGAVAN, JAMAL ZWEIT, Center for Molecular Imaging, Department of Radiology, School of Medicine, Virginia Commonwealth University, Richmond, VA 23284, RAVI HADIMANI, Department of Mechanical and Nuclear Engineering, Virginia Commonwealth University, Richmond, VA, 23284, RAVI HADIMANI TEAM, VITALIJ PECHARSKY TEAM, JAMAL ZWEIT TEAM — Room temperature ferromagnetic Gd_5Si_4 nanoparticles were synthesized using arc-melting and ball milling. We have demonstrated that these particles can be used as improved contrast agents for magnetic resonance imaging. The ball milled Gd_5Si_4 nanostructured material shows ferromagnetic to paramagnetic transition near 340 K revealing long range magnetic order of Gd_5Si_4 phase. The phase structure and the magnetic measurements yield orthorhombic Gd_5Si_4 with magnetization of 45 emu/g. Echo time was measured in a 7T MRI system showing significant reduction compared to the superparamagnetic iron oxide nanoparticles. Such results show the potential of Gd_5Si_4 ferromagnetic nanoparticles as T2 contrast agent for magnetic resonance imaging. However these particles did not show reduction in T1 times.

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