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Applications of low field NMR: Relaxation measurements and resin curing



Nuclear magnetic resonance (NMR) is a powerful analytical tool that allows for noninvasive and nondestructive characterization of the chemical composition of a sample. Furthermore, low field NMR ($B_0 < 1$ T) offers many potential advantages when compared to high field NMR, such as lower costs, smaller size, portability, lower power consumption and the ability to detect through thin metal layers. The versatile characteristics of low field NMR have allowed it to be used for a variety of practical applications. In this talk, I will discuss work being done to measure the T_1 and T_2 relaxation times on the components of the ISMRM/NIST system phantom at field strengths between 6.5 - 550 mT. To emphasize the versatility of low field NMR as an analytical tool, I will then discuss the use of single-sided NMR to monitor the curing process of 3D printing compatible resins.

Short Bio

Michele Martin is a research chemist in the Magnetic Imaging Group at NIST. Her work focuses on low field magnetic resonance system development, quantitative relaxation measurements, and using single-sided NMR for various applications. Michele received a PhD in physical chemistry from the University of California, Davis in 2018. Her thesis work focused on using NMR to solve real world problems. Specifically, she developed a low field, single-sided NMR sensor for detecting the spoilage of tomato paste stored in large, aluminum lined bins.