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Diffusion dependence of proton NMR relaxation rates in the presence of ferritin MICHAEL BOSS, P. CHRIS HAMMEL, The Ohio State University, Dept. of Physics — Ferritin is the predominant iron-storage protein in living organisms. In aqueous solutions of ferritin, protons experience a higher transverse relaxation rate, R_2. This is thought to occur due to a diffusive mechanism, where protons move close enough to the ferritin to pass through a region of elevated magnetic field, and a chemical exchange mechanism, where protons bind to the protein for a period of time, experiencing an even higher magnetic field. These two mechanisms exhibit different dependencies on the self-diffusion coefficient of the protons. By adding glycerol to aqueous solutions, we have been able to control the self-diffusion of protons; this has been confirmed by means of diffusion measurements employing pulsed field gradient techniques. We have measured the relaxation rate of protons in ferritin-containing binary mixtures of water and glycerol using CPMG sequences, and will compare the experimental results to theoretical predictions of diffusion dependence.

Michael Boss
The Ohio State University, Dept. of Physics

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