The first NMR experiment

August 18, 2011

1 Relaxation time calculation results

During the results processing the following relaxation times were calculated: T_1, T_2, T_2^* moreover gyromagnetic ratio constant γ. We will cover up shortly the calculation process for each one of them:

- firstly, the gyromagnetic ratio was calculated out of the given experiment data, after ω_o (the Larmor percession frequency) was found by the following formula: $\gamma = \frac{\omega_0}{B_0}$
- then, out of FID decay slope (after single $\frac{\pi}{2}$ pulse) T_2^* value was evaluated, by detecting the FID peak and fitting the exponential curve
- next, T_1 was calculated by fitting the results of inversion recovery experiment into the curve of $M_\perp(T_I) = \left|M_0\left(1-2e^{-T_I/T_1}\right)\right|$ and ignoring the T_2^* influence
- at last T_2 was found out of two experiment datasets (CP and CPMG) by finding the points on the signal envelope, calculating the logarithm and fitting them into the linear model

Figure 1: Gyromagnetic ratio calculation results

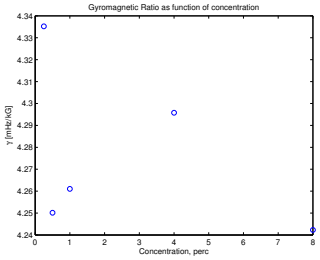

Figure 2: T_2^* calculation results

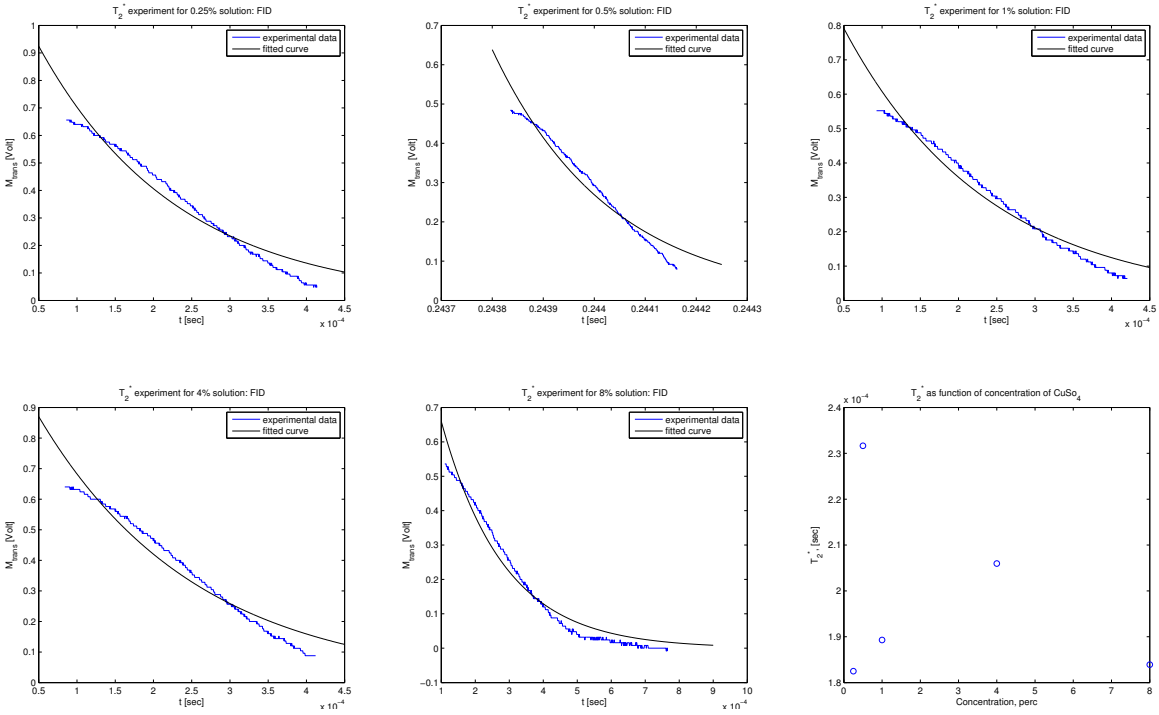

Figure 3: T_1 calculation results

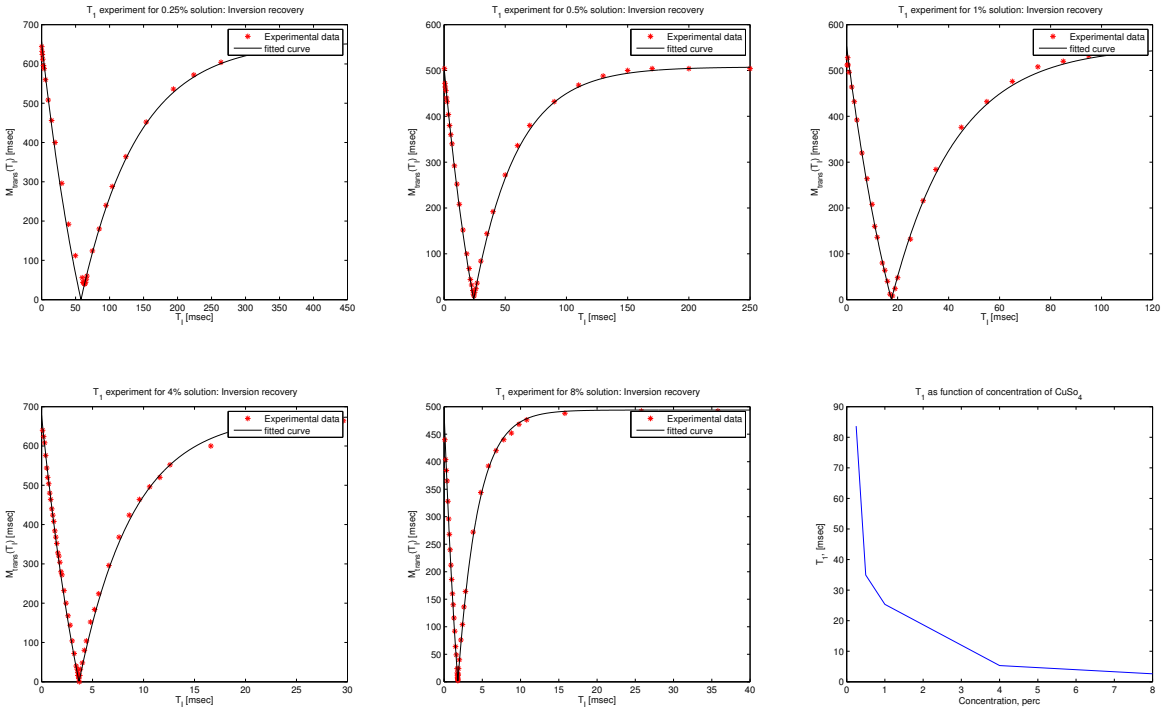

Figure 4: T_2 calculation results using CP sequence

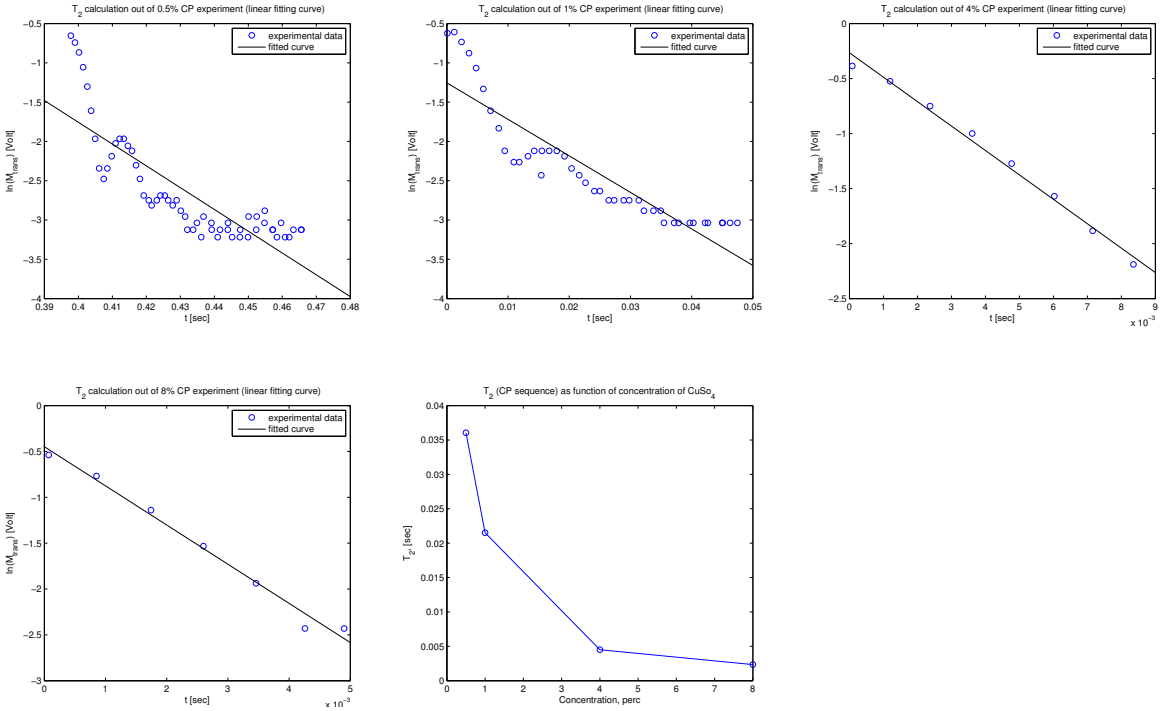

Figure 5: T_2 calculation results using CPMG sequence