



Figure 1. a) Ratio of  $^{15}\text{N}$   $R_{1\rho}$  rates at 60 kHz versus 110 kHz (black) and 90 kHz versus 110 kHz (red). c) Ratio of simulated  $^{15}\text{N}$   $R_{1\rho}$  at 60 kHz MAS and 110 kHz MAS  $R_{1\rho}(60 \text{ kHz}) / R_{1\rho}(110 \text{ kHz})$  (with a fixed spin-lock RF power of 13 kHz) as a function of order parameters,  $S^2$ , and the correlation times,  $\tau_c$ .