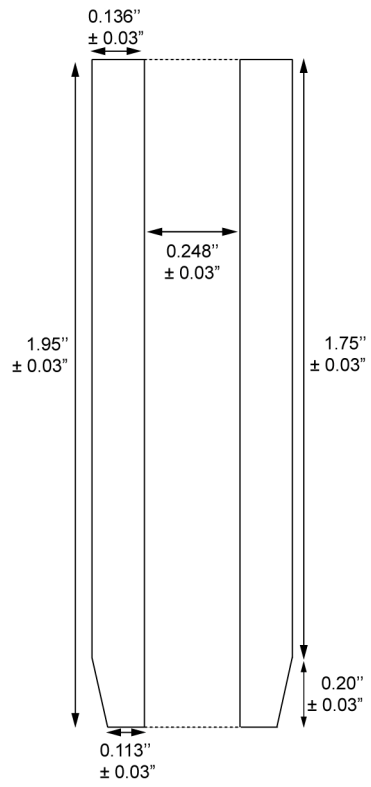
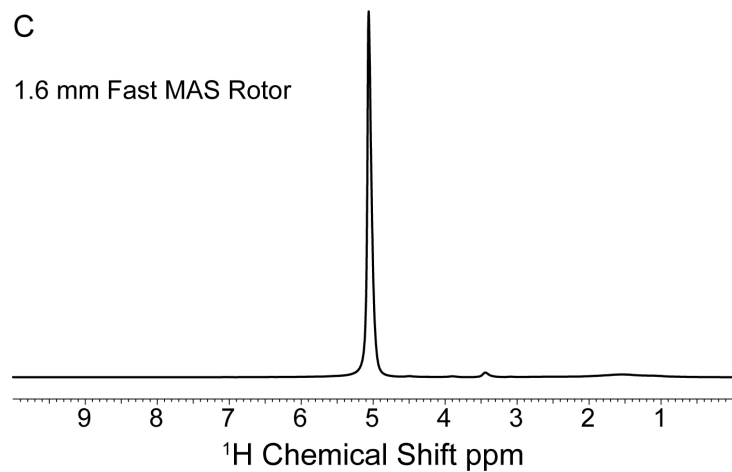
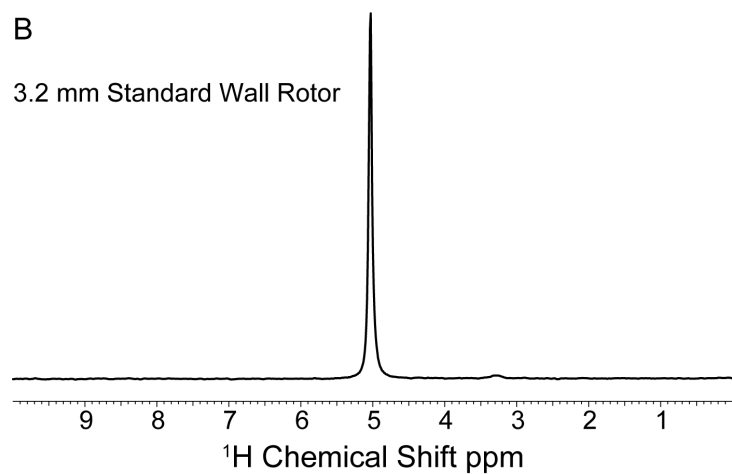
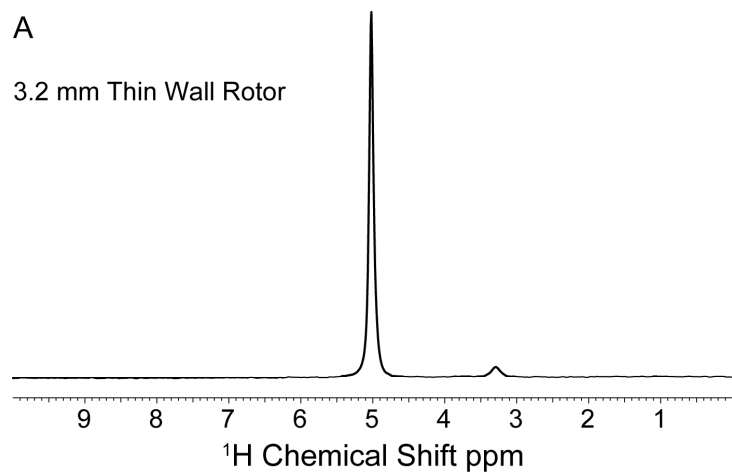


**Fig. S1.** Detailed schematic of the different components for the RPD. The top piece (a) and bottom piece (d) are constant between all three models whereas the funnel piece (b) and rotor chamber (c) differ depending on the size of the rotor.



**Fig. S2.** Detailed schematic of the RPD balance.



**Fig. S3.** One-dimensional  $^1\text{H}$  NMR spectra of the DMPC:ORO samples in a (a) 3.2 mm thin wall, (b) 3.2 mm standard wall, and a (c) 1.6 mm fast MAS. 32 scans were collected for each spectrum and was processed with 20 Hz line broadening.