Supplemental Information

In the course of our studies, we have noted evidence for impurities in our ^{1}H NMR spectra. Examples are given below in Figures S1 and S2. The ^{1}H NMR spectra in Figure S1 show the original sample of the $Mg(AOT)_2 \bullet 6D_2O$ in d_6-DMSO and samples to which other organic solvents had been added. By spiking the sample with different solvents that were used throughout the procedure, that is, ethanol, methanol, diethyl ether, and heptane, we were able to determine the identity of the imputity. From the doping experiment we were able to determine that the impurtiy came from ether. The ^{1}H NMR spectra in Figure S2 show the different MAOTs at a "wet" w_0=5. These are considered "wet" because these samples were dried only for a very short time and therefore not all residual water or extractant was removed. When comparing the "wet" w_0=5 to Figure 4C the water peak is much larger and shifted further down field, indicating more water present, in the "wet" w_0=5. Note in the ^{1}H NMR for NaAOT, KAOT, and RbAOT the at ~4.4ppm which is extractant that was not completely removed. ^{1}H NMR spectra were collected as described in text.

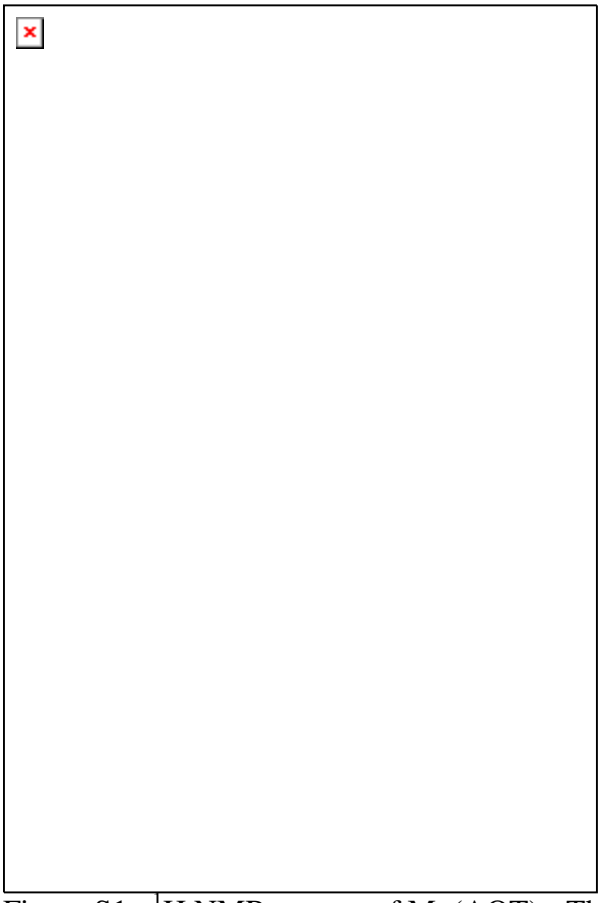

Figure S1. ^{1}H NMR spectra of $Mg(AOT)_2$. The bottom spectrum corresponding to the original $Mg(AOT)_2 \bullet 6D_2O$ in d_6-DMSO shows an impurtity peak at ~1.1 ppm; second from bottom spiked with ethanol; third from bottom spiked with diethyl ether, second from top spiked with methanol, top spiked with heptane. The match with the spectrum second from the bottom reveals the impurity is ether.

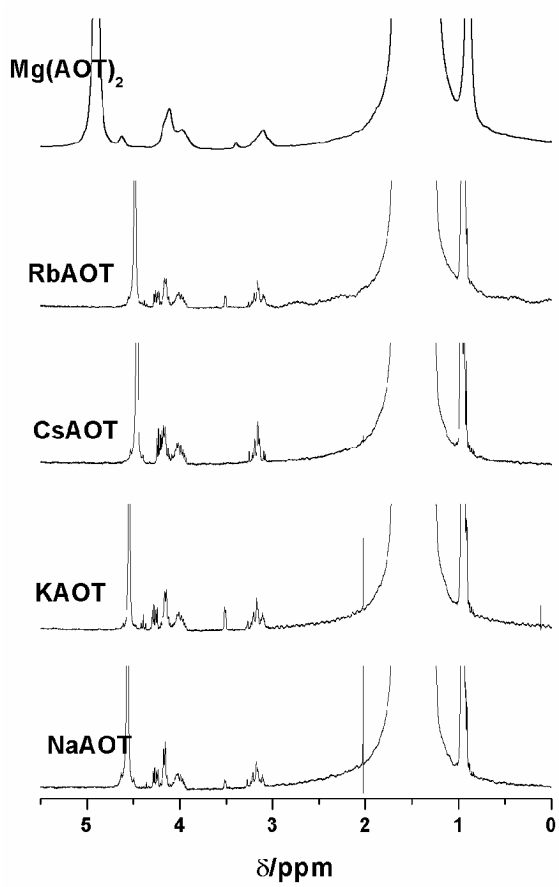

Figure S2. ^{1}H NMR spectra of wet MAOT samples, that is, samples that have not been completely dried.