A Study of R2 Values of Water in Synthetic Soils

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Our group has been investigating the NMR signals from water in mono-dispersed glass bead systems. It was found that as glass bead size decreases the spin-spin relaxation rate (R2) of water increases. We have observed that per sample, the number of exponential components in the transverse decay curve characteristic of R2 relaxation, is not guaranteed to be the same number of components found in the longitudinal decay curve, characteristic of R1 relaxation. We found that as particle size decreases, one type of water becomes more prominent than the other type of water, leading to changing values of R2. These results are consistent with a prior R1 study by our group. Our results agree with a model that there are at least two types of water in the system (water that reacts with the surface of the particles and water that has no interaction with the glass surfaces).