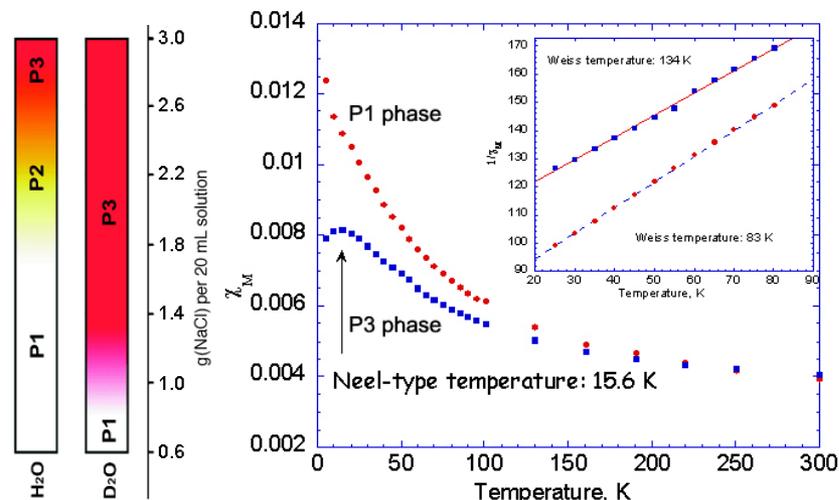
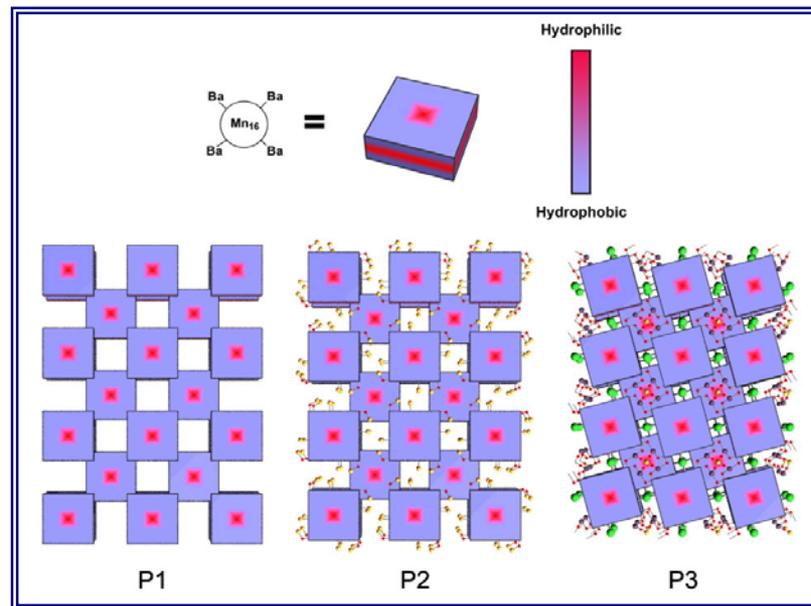


Structural Isotope Effect

Sergiu M. Gorun, Brown University, DMR-0233811

Hydrogen isotopes are used in chemistry, biology, and material sciences mostly for their kinetic effects. We report here evidence that isotopomer variations can affect the way metal complexes form supramolecular aggregates. The isotope effects are mimicked to a certain extent by variations of ion concentrations. For manganese aggregate systems, a unique phase, P2, is observed in H₂O, but not in D₂O. Phase differentiation results in tuning of magnetic interactions from those characteristic of a molecule, P1 phase, to those characteristic of a solid, P3 phase.

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Isotope induced packing and magnetism of Mn₁₆ blocks.

Structural Isotope Effect

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Education:

Jaeho Lee, a graduate student about to start a postdoctoral appointment at the University of Minnesota, was the major contributor to this work. Denis Yuan, an undergraduate, also contributed. He is now a graduate student at Temple University. Philip Kalisman, a sophomore, has just started to work on this project. Collaborative work with Dr. Serena George, Stanford Linear Accelerator, will be reported in due course.

Jaeho has presented his work twice at isotope effects and water Gordon Research Conferences. The PI was invited to the International Isotope Effect Conference in Sweden (2003) and will present this work at the upcoming jubilee Isotope Gordon Research Conference in Ventura, CA, 2004.