Bio-mimicking Self Assembly in Materials: Role of Hydrogen and Halogen Bonding

Ashwani Vij, Joseph M. Mabry, Wade W. Grabow, Vandana Vij, *AFRL/PRSP-PRSM, 10 E. Saturn Blvd. Edwards, CA 93524.* E-mail: ashwani.vij@edwards.af.mil

Hydrogen bonding to an electronegative heteroatom is becoming an increasingly interesting area for chemists, biochemists and biologists. Because of such interactions, proteins can interact with drugs, which has enhanced our understanding of various biological processes within the body. We have made similar attempts to investigate the structures and properties of "big" small molecules, especially those containing silicon using a "macromolecular" approach to deal with data quality and diffraction issues. Halogen bonding in molecules containing silicon and tin is a favored process due to the capability of these atoms to expand their coordination spheres. Such an expansion of the coordination sphere can sometimes result in formation of unexpected crystal structures, which impart If these systems contain outstanding physical properties. fluorocarbons or fluorinated ligands, there are domains of hydrophobicity and hydrophilicity. The challenge is, however, to overcome the low temperature phase transitions to obtain meaningful crystal structures without the destruction of crystal lattice. Data collection employing CCD or GADD detectors utilizing a sealed tube (Copper or Molybdenum) or rotating anode sources and structure solution/refinement strategies will be discussed, time permitting.

Distribution A: Approved for public release, distribution unlimited **Keywords: self assembly, biomimicking, halogen bonds**