

## W0025

**Crystal Growth that Targets Noncentrosymmetric Structures.** Kenneth Poeppelmeier, Dept. of Chemistry, Northwestern Univ., Evanston IL 60208-3113.

The rational design of crystal structures, in particular noncentrosymmetric structures, is an emerging theme of crystal engineering and inorganic solid state chemistry. It is well known that noncentrosymmetric solids, i.e. those with no centers of symmetry, give rise to important dielectric and elastic properties, including ferro-, pyro- or piezoelectricity, ferroelasticity and optical activity. While the particular noncentrosymmetric crystal classes required for solids to exhibit these properties are well known to crystallographers, the structural design principles that facilitate rational chemical synthesis of polar, chiral or polar-chiral structures must be understood in order for the chemist to project particular molecular or ionic chemical species, inorganic as well as organic, into the appropriate crystal classes. The coupling of a robust synthetic methodology also is important. Our research makes use of multiple Teflon pouches, which contain the reagents, that are heat sealed and placed inside a reaction vessel. Examples will be given to illustrate the synthesis of linear, zigzag or helical chains when two vertices of an octahedron, which are either adjacent (cis) or opposite (trans), are linked.