

*Recent Advances in the Design and Characterization of Amphidynamic Crystals and Molecular Machines*

Miguel A. Garcia-Garibay

Department of Chemistry and Biochemistry, University of California, Los Angeles, CA 90095

The design of crystalline molecular machines is stimulated by the possibility of creating new materials with physicochemical and mechanical properties that are responsive to external stimuli. Condensed phase matter with anisotropic molecular order and controlled dynamics, also referred to as *amphidynamic crystals*, offer a promising platform for the design of complex functions. Recent studies have shown that it is possible to engineer molecular crystals and extended solids with Brownian rotation that can be interfaced with external fields, and which may be used to design novel optical materials. The design and synthesis of molecular machines with correlated motion, and with of multiple “parts” will be essential to further realize increasingly complex functions. Recent progress in the design of amphidynamic materials, suggests that sophisticated functions similar to those of simple biomolecular machines may eventually be within reach.