

WESTERN RESEARCH FORUM 2019

PHOTOSWITCHABLE SELF-COMPLEMENTARY HYDROGEN BOND ARRAYS

Abstract: Photochromism is the reversible transformation of a chemical material to another form by the absorption of electromagnetic radiation (light), where the two metastable forms have distinct absorption spectra and other properties. Photochromism in materials allows for the switching of their function solely based on irradiation with light. Polymers are used frequently as the building blocks for materials as they are versatile, multifunctional, can carry charge and be processed by solution-based deposition methods. Supramolecular polymers share the same definition as polymers with the exception that they are held together by reversible and directional non-covalent interactions such as hydrogen bonds. Synthesizing supramolecular polymers with hydrogen bonds can be carried out in two possible arrangements. Hydrogen bonds can form between different (complementary) or the same monomeric end groups (self-complementary). This poster presentation will focus on our recent efforts toward the investigation of the strength and fatigue-resistance of the hydrogen bonding interaction between self-complementary hydrogen bond arrays intended for elaboration in supramolecular polymeric materials. The supramolecular and photophysical properties will be examined using UV-vis Spectroscopy, Nuclear Magnetic Resonance, and dilution experiments. Future steps include incorporating these photochromic compounds into functional polymers to evaluate the photocontrolled elasticity, molecular alignment and self-healing abilities of the resulting materials.