



Chemistry Seminar

“Mechanochemistry and an Investigation of Stress-Induced Chemiluminescence of A Synthetic Polymer”

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Friday, Dec. 4

12:30 p.m.

WSB-122

Abstract

Mechanochemistry originated during the time of Aristotle in the fourth century. The process was not understood at the time, but the simple reaction of cinnabarite under mechanic force ignited the interest of scientists throughout the world as our understanding of the reaction evolved. Through the discussion of early experiments carried out by those who can be known today as the founder's of modern mechanochemistry, a background reference is developed. Subsequently, the three main sub-discipline of mechanochemistry are delineated with emphasis placed on the reactions of solid-state and synthetic polymer mechanochemistry. The mechanisms of mechanical activation are discussed of related examples of each area. Lastly, the current focus of mechanochemistry is investigated through the description of a synthetic polymer, which is funtionalized and then bound to a chromophore. Under mechanical stress, these polymer—chromophore macromolecules undergo a ring-opening mechanism which breaks the centralized bond of the polymer. The action induces a visible color change within the polymer and thus promises to have diverse applications in commercial products since signs of mechanical stress or structural failure points may be visually detectable.