Optically and Thermally Induced Switching of Molecules on Metal Surfaces

Petra Tegeder

Freie Universität Berlin, Institut für Experimentalphysik, Arnimallee 14,
D-14195 Berlin/Germany

Understanding the switching ability of molecules on surfaces upon excitation with external stimuli is a prerequisite for the development of functional molecular devices with possible applications to information processing, storage, or switching. While the switching mechanisms in many classes of molecular switches are thoroughly studied and understood in solution, their counterparts on surfaces still remain largely unresolved. In particular, many switching processes are suppressed or irreversible when the molecules are anchored to a metallic substrate. The adsorption configuration and steric hindrance are only one factor influencing the switching capability. More important is the electronic coupling strength between adsorbate and substrate and accordingly the lifetime of molecular excited states which is significantly reduced at metal surfaces. I will discuss several examples of optically and thermally induced conformational changes in molecular switches at noble metal surfaces [1–4].