

## **Stimuli-Responsive Surfaces by Electrografting**

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The design of stimuli-responsive coatings on a variety of solid surfaces is the topic of increasing researches. In this area, the adhesion of a stimuli-responsive polymer to the inorganic support whatever the conditions of pH and temperature, remains a concern. In this field, we have been studying an electrochemical process able to initiate the polymerization of acrylic derivatives together with promoting their chemisorption to the substrate used as electrode. We have demonstrated the versatility of this method that can be applied to a variety of acrylics leading to the possible generation of responsive coatings to either pH or temperature. Reversible anchoring of molecules of interest has also been achieved recently by this method based on the grafting of dienes able to bind a dienophile and release it at higher temperature by retroDiels-Alder reaction. The electroinitiation has been found compatible with a variety of surfaces going from conventional metals (iron, steel, gold) to carbon (fibers and nanotubes) and semi-conductors (doped-silicon), which spreads the applications to various fields such as medical devices, biosensors, catalysis, electronics and photovoltaics. Particularly, the application of this process to AFM tips allows the straightforward functionalization of these devices allowing not only the handling of polymers at the molecular level but also the elaboration of various temperature, pH or analyte sensitive sensors at the nanometer scale.