UFR de Chimie

Master Molécules, Matériaux, Surfaces

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Séminaire de Chimie Autour des Nanosciences

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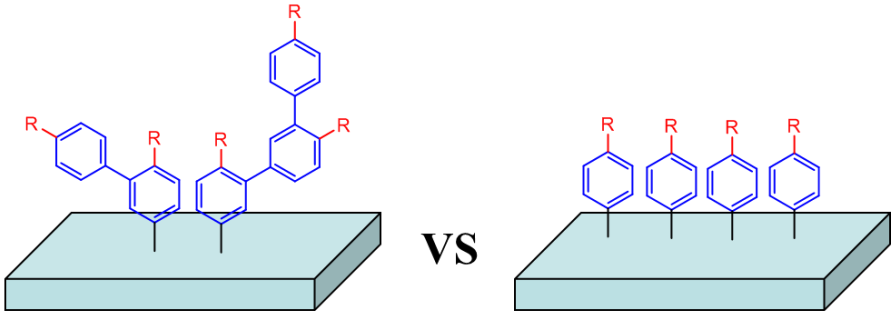
ATTACHMENT OF ROBUST FUNCTIONAL MONOLAYER BY REDUCTION OF ARYL DIAZONIUM SALTS

Since the earlier works of Whitesides and coworkers concerning the preparation of Self-Assembled Monolayers (SAMs) on gold substrates, SAMs represent one of the best systems available for studying the contribution of molecular structure and composition to the macroscopic properties of materials. Unfortunately, this technique cannot be extended to other materials and provides weakly robust interfaces, which make them suitable for laboratory research but limit their use in real applications.
Since its discovery in the beginning of the 90s, the (electro-) reduction of aryl diazonium salts is now often used as surface modification technique. The main advantages of this technique are: i) it produces highly robust interfaces and ii) it can be applied to a wide range of materials (conductors, semiconductors, insulators). Its major drawbacks remain in the difficulties of controlling the vertical extent of the reaction. Aryl radicals that are produced during this process, are highly reactive species and they rapidly add to the substrate electrode where they are produced, but also react with the already-grafted aryl layers. This generally leads to multiple attachments and formation of disordered poly-aryl multilayers.
Only recently, a few research groups proposed new methods to achieve monolayers onto carbon surfaces, using the electro-reduction of aryl diazonium salt. These new approaches can lead to the development of carbon materials as substrates supporting functional monolayers and can find applications in electrochemical (bio) sensors, analytical chemistry or molecular electronics. In this presentation, an overview of the different methods used to control the thickness and organization of electro-grafted organic layer by the reduction of aryl diazonium salts will be presented.



Disorganized multilayer Organized monolayer

LE VENDREDI 30 Septembre À 11H00

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