

SURFACE (ELECTRO)CHEMISTRY OF CARBON MATERIALS. ABOUT THE ROLE OF OXYGEN AND NITROGEN HETEROATOMS

Surface chemistry plays a relevant role in the physicochemical properties of carbon materials. It is highly influenced by the presence of heteroatoms (mainly oxygen and nitrogen, but also phosphorus, boron and sulfur) that may form different surface functionalities. They can be found naturally on the carbon surface, but they can also be generated during the carbon material preparation or by subsequent treatments. The occurrence of diverse surface functionalities over the carbon surface governs its reactivity, chemical stability, physical properties and structure. Given the practical implications of the surface chemistry on the use of carbon-based materials, it is a topic of huge interest. Along with the porous structure, the surface chemistry dictates the potential use of carbon materials in many applications. Among these applications, many of them involve electrochemical processes in which the electroactivity of carbon active sites and reactivity of carbon materials in the presence of an electrolyte and a solvent, play a determining role. Thus, the main objective of this lecture is to summarize what we have learnt about Surface Electrochemistry of carbon materials. I will mainly talk about O and N functionalities, paying special attention to: electrical conductivity, wettability, electroactivity and reactivity with the electrolyte and the solvent.