**Perspectives for carbons in environmental applications**

Ana Arenillas1, Tomás Cordero2

*1INCAR-CSIC, Oviedo, Spain*

*2Universidad de Málaga, Departamento de Ingeniería Química, Málaga, Spain*

aapuente@incar.csic.es, [*cordero@uma.es*](mailto:cordero@uma.es)

Energy supply and the preservation of the environment are some of the current concerns for society and for the scientific community. Research and development on carbons is aware of that as shown in this congress with the section “Carbons for Environmental Applications”. Starting from the fact that carbon is a unique element which can form several and very different nanostructures, the research in carbon materials is tremendously broad and covers numerous applications, most of them related with the environmental. Among them it can be highlighted the following topics that will be covered in this session of hot-topics: adsorption, catalysis and bio-carbons.

Taking advantage of the possibility of porous properties of carbons, maybe one of the oldest uses of carbon materials is as **adsorbent of pollutants either in gas or liquid phase**. Maybe one of the most interesting researches in this area nowadays is their use for separation of mixture of gases such as CO2/CH4 (from biogas production processes) or CO2/N2 (in post-combustion systems) for further storage of CO2 and valorisation of the CO2, CH4 and the rest of gases of the stream. Regarding to the use of carbons in liquid phase, the most relevant issue is related to water and wastewater treatments, where carbons are use as adsorbent or catalyst to eliminate different pollutants, being the inhibition of nitrification of water a current serious concern due to the massive use of fertilizers in agriculture. One of the hot-topics selected for this section of “Carbons for Environmental Applications” deals with this problem. However, it can be said that carbon materials are mainly used, in their several forms, as catalyst or support for **catalytic reactions**. This application covers many different catalyses from stablished industrial processes to new emerging technologies. Always searching more efficient, cleaner and cheaper processes, even avoiding traditional catalyst based in the expensive noble metals. The electrolysis of water for H2 generation, besides the use of carbons in electrochemical applications (i.e. energy generation and storage) has a great interest nowadays and they are covered in other section of CESEP’19. Especially interesting is the photocatalysis that combines a catalytic process with renewable energy, the production of biofuels, and methanation reactions, which besides the elimination of CO2, the production of fuels such as CH4 or H2 are pursued. The other hot-topic of the section “Carbons for Environmental Applications” addresses this topic, combining methanation reaction with new strategies for carbon monoliths production by 3D printing. The use of **bioresources for carbon materials** production has also relevance, since it is a way of either using renewable and/or cheaper resources or they are a way for waste valorisation and could be included in a biorrefinery scheme where liquids (chemicals), gases (energy and chemicals) and solids (carbon materials) would be obtained by different thermochemical processes. In fact, catalysts produced from biomass could be use in the catalytic conversion of chemicals from biomass in a biorrefinery context.

Special mention has to be paid to the use of carbons for **biotechnological applications**, as supports for enzymes, drug delivery, magnetic carbons, scaffolds for growing tissues, etc.

**References**

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