Julien Vieillard, Res. Rev. J Mat. Sci. 2017, 5:5
DOI: 10.4172/2321-6212-C1-005

Functionalization of cocoa shell (CS) surfaces using nanoparticles and their application in CO_2 storage

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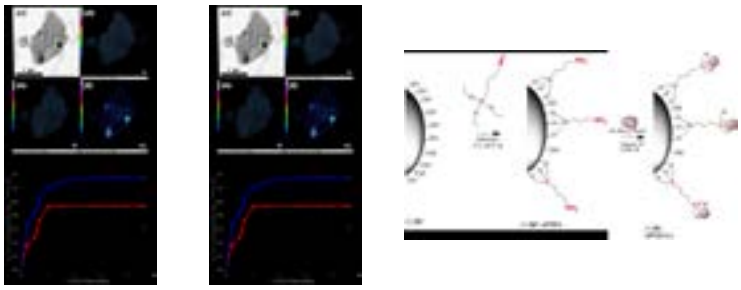
The aim of this research is to investigate how the covalent grafting of cocoa shell surface (CS) may improve its activity for the adsorption of CO_2 at 20°C. Pure cocoa shells (CS) are agricultural by-products, usually inexpensive and abundantly available. They were functionalized by salinization and subsequent immobilization of cobalt nanoparticles (Co-NPs). In parallel, some carbon material was generated by hydrothermal treatment then post functionalized to increase the cocoa shell specific surface. Finally some core-shell nanoparticles have been also synthetized using cocoa shell as a core and zinc oxide as a shell, then some post-functionalization with nanoparticles insertion were added. The physical and thermal properties of the adsorbents like analysis stability, surface charge and morphology were investigated by FTIR, SEM, TEM, EDX, BET, DSC and zeta potentiometry techniques. The performance for the CO_2 capture was investigated and the high adsorption capacity was mainly attributed to their original structure.



Biography

Julien Vieillard has his expertise in analytical chemistry in order to promote innovative material or new application. Thus, in the recent year, we tried to promote natural bio waste for CO_2 sorption. Actually, our research is also focused to develop original optical, electrochemical biosensors and antibacterial treatment for metallic surface.

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