

JOINT EVENT ON

5th International Conference on Bioplastics and 6th World Congress on Biopolymers

September 07-09, 2017 | Paris, France

Olive stones characterization and analysis of their use as raw material in construction industry

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Olive stones are waste that had been widely used as biofuel in diverse industries and as heating in homes, hotels and municipal facilities. The crushed olive pit is also used as an adsorbent after being converted to active carbon by increasing its specific surface area. This material, in the form of powder or granular, has various applications as a filter for water treatment in chemical and pharmaceutical industries. In recent years, this residual material has been used as an adsorbent without pretreatment or with a series of pretreatments for the removal of metal ions in industrial waste water. The objective of these investigations is the physicochemical and environmental characterization of this residual material and the feasibility analysis of its use as a pore former in ceramic matrices. This material has been characterized with the following techniques: scanning electron microscopy with semi quantitative chemical analysis (SEM-EDS), differential thermal and thermogravimetric analysis (DTA-TGA), X ray diffraction (XRD), ecotoxicity, among others. Figure 1 shows the microscopic appearance of the broken stones by SEM. DTA- TGA analysis of this material is shown in Figure 2. It can be seen some exothermic peaks corresponding to the combustion of hemicellulose, cellulose and lignin phases. This organic material is burned in a wide temperature range, between 250°C and 550°C. This is important to ensure that when this material is incorporated into clay mixtures as pore former, the sintering process takes place without crack formation in the brick. XRD analysis presents some peaks corresponding to semi crystalline cellulose at 21.8, 31.7, 34.5 and 45.3 degrees. The ecotoxicity essay demonstrates that this type of waste can influence the development of sensitive species, when it is deposited on land without control. Therefore, special care must be taken during the stocking of this material when it is used as raw material of other processes, for example in construction industry.

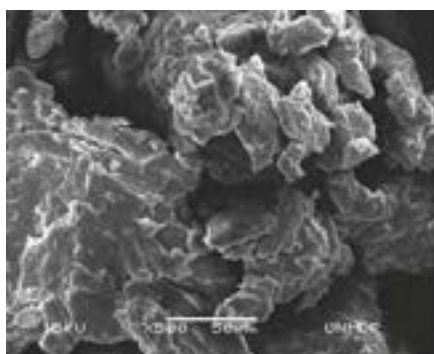


Figure 1: SEM images of olive stones

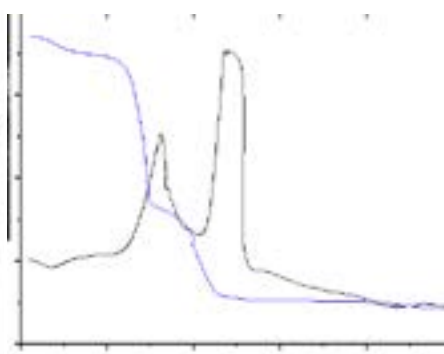


Figure 2: DTA-TGA analysis

Biography

Nancy Quaranta obtained her PhD in Chemistry at the National University of South (UNS-Argentina). She is a Researcher of the Scientific Research Commission of Buenos Aires Province. She is the Head of Environmental Studies Group and Materials Program Coordinator at the National Technological University. Her current research fields are materials and environmental sciences. She is author of numerous publications and presentations at international congresses. In the last years, her work has been oriented to the study and valorisation of industrial wastes, in particular residual biomasses of the agroindustry.

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