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Obtaining activated charcoal support starting from vegetal wastes

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The purpose of this paper was to use and add value of some vegetal cellulosic wastes, rich in carbon, useful raw material for obtaining the active charcoal by pyrolysis. The modern techniques of investigation, promoted by scientists and supported by studies, sustain the development of new useful products as filler for air filters. This plant material consisted of *Hyppophae rhamnoides*, *Ribes nigrum* - sprigs and *Aloe arborescens* cakes. Sprigs and cakes, remaining after plant exploit, were pyrolyzed and turned into charcoal to be used on air filters, as support for fixing noxious compounds, unwanted for the maintaining of health.

To achieve experimental investigation “The pyrolysis in fixed flow” was applied using plant material samples. The experimental pyrolytic system used was a modern one, and mass loss of the layer of pyrolytic oil accumulation and temperature field in different areas of the facility were online monitored.

The plant material and charcoal obtained in that study were analyzed morphologically and structurally, by fast laboratory techniques: **SEM** (with a Vega Tescan LMU II apparatus) and **Infrared Spectroscopy (FT-IR)** (using a prestigious FT-IR spectrometer -Shimadzu, Japan). As a result of the production of activated charcoal from plant material wastes and following its morphological and structural analysis, the following can be concluded: FT-IR spectra obtained from plant wastes material prior to the pyrolysis process, reveal large amounts of cellulose, hemicellulose and lignin, and the presence of specific oils especially at *Hyppophae rhamnoides* wastes compared with the others wastes.

From the SEM images, the porosity of the active charcoal was obtained. The wastes were carbonized at high temperatures in the presence of vapors, forming internal porous structure with variable particle diameters between 10 and 120 µm. Active charcoal made from *Hyppophae rhamnoides* - sprigs has a small pore size - 10 µm and has a high specific surface area and superior adsorption characteristics compared to other charcoal types that have with a larger pore size (100-120 µm) and nonhomogeneous dispersion in the case of *Aloe arborescens* charcoal.

Active charcoal resulting from *Hyppophae rhamnoides* - sprigs, following the pyrolysis process, following charcoal activation technology that involves the development of pores in terms of weight loss and the advancement of temperature and activation time, starting with ultramicroporosity, which is gradually transformed into micropores and then into mesopores, has good features to be used to make filling for air filters.

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