

Method for promoting in-situ hydrochar porosity in hydrothermal carbonization of almond shells with air activation



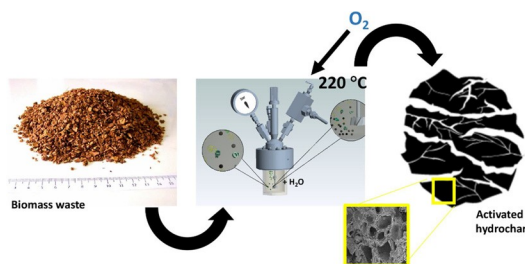
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GRAPHICAL ABSTRACT



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ABSTRACT

In this work, a new procedure for *in situ* hydrochar activation during hydrocarbonization of biomass (almond shell) is proposed. This approach suggests the addition of a controlled oxidizing gas stream (i.e. synthetic air) during the process for different periods of time, in order to promote the hydrochar porosity. Characterization of prepared materials revealed a noticeable development of porosity with apparent surfaces areas up to 320 m²/g. A highlighting variety of functional acid groups especially sensitive to air supply time was confirmed by surface chemistry analysis. Promising preliminary results show the effectiveness of this alternative approach synthesis strategy in converting a low value lignocellulosic biomass into porous materials with potential applications such as adsorption, electrical energy and gas storage or catalysis.