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OXIDATIVE FUNCTIONALIZATION ASSESSMENT OF A POPLAR BIOCHAR

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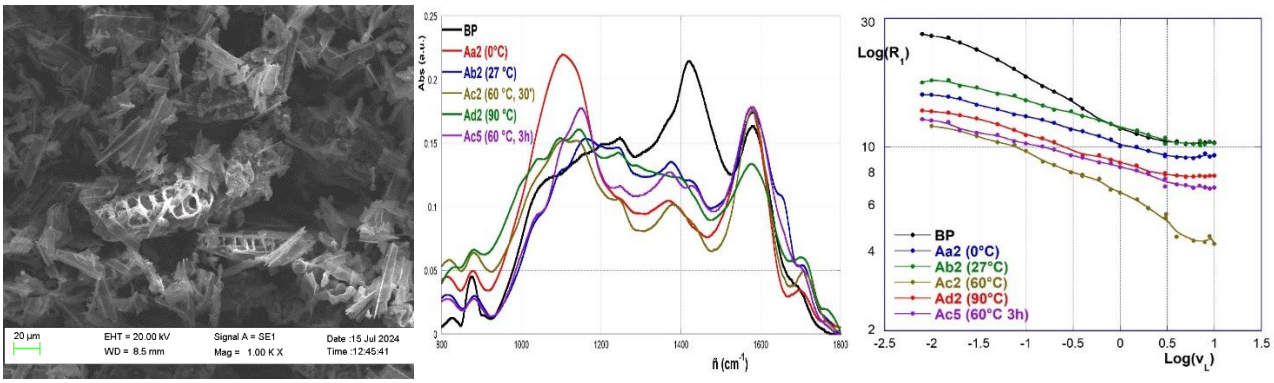
Chemical functionalization of biochars is main route to the modulation of their physical and chemical properties. This, of course, requires a careful study of the outcome of the reaction method and conditions used (reactants, temperature, time, solvent, etc) on the features of the obtained product. This, in turn, is a mandatory requirement in order to set up an effective, and possibly sustainable, functionalization protocol. Hence, this study aims at exploring the functionalization of a poplar biochar obtained by high-temperature pyrolysis (1200 °C), under oxidative conditions typically used on Organic synthesis, such as the sulphonitric mixture (i.e. conc. HNO_3/conc. H_2SO_4 1:3 v/v) and the "piranha mixture", applied for different reaction temperature and times. The obtained products were characterized by combined imaging (SEM), spectroscopic (ATR-FTIR) and FFC-NMR relaxometric techniques. In particular, relaxometric data, rationalized in terms of the Kohlrausch stretched exponential kinetic model [1], were analyzed by means of a recently proposed heuristic method [2,3], The results obtained enabled us to rationalize the effect of the reaction conditions, and draw some hypotheses on the dynamics of water within the pore network of the materials.



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