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Production of activated biochar from Moroccan macro-algae residues

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Sustainable conversion methods of organic industrial residues for producing new low cost activated/unactivated biochar, which have received more attention in recent years. Those processes and conversion methods were not only used for producing biochars but also, due to their huge positive benefits on environment protection and remediation, could contribute to minimize the number of industrial residues. Slow pyrolysis, which is one of the most conventional types of pyrolysis that has been used for thousands of years primarily for the biochar production, represents an efficient solution to convert these residues to valued bio-products. In the remediation field, activated biochars produced from organic waste have proved the ability to remove many kinds of micropollutants and they showed good results by comparing to commercial activated charcoal. In this study, the production of activated biochars was carried out using a one-pot activation/pyrolysis method with different type of chemical agents and pyrolyzed at 2 different temperatures. The solutions of chemical agents were proceeded on raw macroalgae residue using a simple spray system, unlike activation baths that require large volumes of chemical solutions. All the unactivated/activated biochars were analyzed and characterized by different methods and analysis techniques (CHNS, HPLC, FTIR, SEM, EDS, zeta potential). After that adsorption experiments using methylene blue as micropollutants in aqueous medium were realized to evaluate the removal efficiencies of produced biochars. The results showed that biochars activated by alkaline agents gave high removal efficiencies: they range between 87 to 91.47% compared to 97.78% with commercial activated charcoal.

Biography

Saida Tayibi obtained her Master's degree in physic-chemistry of materials. Now, she is a PhD student at SupAgro Montpellier-France. Her thesis subject represents a part of project ATLASS in collaboration with SupAgro & INRA-Montpellier, Mohammed VI Polytechnic University-Benguerir, and APESA-Pau.

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