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Preparation of biochar from sewage sludge

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Biomass waste materials appropriate for biochar production include crop residues (both field residues and processing residues such as nut shells, fruit pits, bagasse, etc), as well as yard, food and forestry wastes, and animal manures. Biochar can and should be made from biomass waste materials and must not contain unacceptable levels of toxins such as heavy metals which can be found in sewage sludge and industrial or landfill waste. Making biochar from biomass waste materials should create no competition for land with any other land use option—such as food production or leaving the land in its pristine state. Large amounts of agricultural, municipal and forestry biomass are currently burned or left to decompose and release CO_2 and methane back into the atmosphere. They also can pollute local ground and surface waters—a large issue for livestock wastes. Using these materials to make biochar not only removes them from a pollution cycle, but biochar can be obtained as a by-product of producing energy from this biomass.

Sewage sludge is a by-product from wastewater treatment plants, and contains significant amounts of heavy metals, organic toxins and pathogenic microorganisms, which are considered to be harmful to the environment and all living organisms. Agricultural use, land filling and incineration are commonly used as disposal methods. It was, however, reported that sewage sludge applications in agriculture gives rise to an accumulation of harmful components (heavy metals and organic compounds) in soil. For this reason, pyrolysis can be considered as a promising technique to treat the sewage sludge including the production of fuels.

The objective of this work is to study the advantages of the biochar prepared from sewage sludge.