



Hydrothermal Carbonization: a feasible solution to convert biomass to soil?

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The erosion of fertile soil is a severe problem arising right after peak oil (Myers 1996). That this issue is not only a problem of arid countries is shown by the fact that even the European Commission defined certain milestones to address the problem of soil erosion in Europe (European Commission 2011). The application of bio-char produced by torrefaction or pyrolysis for the remediation, revegetation and restoration of depleted soils started to gain momentum recently (Rillig 2010, Lehmann 2011, Beesley 2011).

Hydrothermal carbonization (HTC) is a promising thermo-chemical process that can be applied to convert organic feedstock into fertile soil and water, two resources which are of high value in regions being vulnerable to erosion. The great advantage of HTC is that organic feedstock (e.g. organic waste) can be used without any special pretreatment (e.g. drying) and so far no restrictions have been found regarding the composition of the organic matter. By applying HTC the organic material is processed along a defined pathway in the Van Krevelen plot (Behrendt 2006). By stopping the process at an early stage a nutritious rich material can be obtained, which is known to be similar to terra preta. Considering that HTC-coal is rich in functional groups and can be derived from the process under “wet” conditions, it can be expected that it shall allow soil bacteria to settle more easily compared to the bio-char derived by torrefaction or pyrolysis. In addition, up to 10 tons process water per ton organic waste can be gained (Vorlop 2009).

Thus, as organic waste, loss of fertile soil and water scarcity becomes a serious issue within the European Union, hydrothermal carbonization can provide a feasible solution to address these issues of our near future. The presentation reviews the different types of feedstock investigated for the HTC-Process so far and gives an overview on the current stage of development of this technology.

References

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