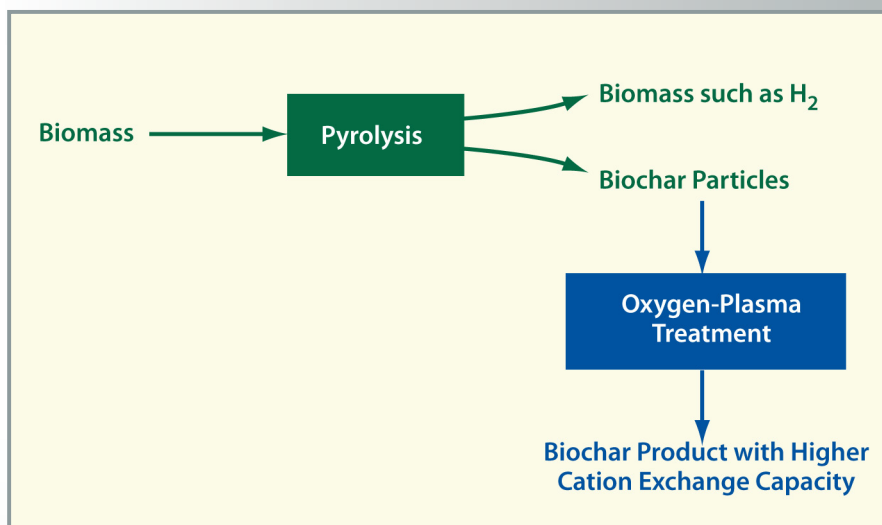


Enhancing Cation-Exchange Capacity of Biochar for Soil Amendment and Global Carbon Sequestration

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Technology Summary

Photosynthesis captures more carbon dioxide from the atmosphere than any other process on Earth. However, because biomass is not stable and is always decomposing, it is of limited use for carbon isolation. In contrast, carbonized biomass, or biochar, is very stable. This ORNL invention is a process technology that can improve the soil nutrient properties of biochar by enhancing its cation exchange capacity.

The invention may be applied to charcoal materials that are produced from pyrolysis of biomasses, such as agricultural and forestry waste materials. Benefits of this invention include improved soil fertility, decreased fertilizer runoff, and long term sequestration of carbon in soils and subsoils. Because biochar is so stable, it can keep carbon secure for a very long time. The primary applications of this technology are soil amendments and carbon sinks.

Advantages

- Higher cation exchange capacity
- Offset CO₂ emissions
- Improved soil fertility
- Decreased fertilizer runoff

Potential Applications

- Carbon sequestration
- Soil amendment and fertilizer

Patent

James W. Lee, Archibald C. Buchanan III, Barbara R. Evans, and Michelle K. Kidder, *Enhancing Cation-Exchange Capacity of Biochar for Soil Amendment and Global Carbon Sequestration*, U.S. Patent Application 12/686,831, filed January 13, 2010.

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