



Biomass Absorbent to Remediate Phosphate and Phosphate-Containing Pesticides (Organophosphates)

Organophosphate can contaminate groundwater—and ultimately drinking water—even at low concentrations. In addition, phosphorous can migrate to lakes and streams, causing algal growth and eutrophication. No commercial product currently exists to remove organophosphates, such as glyphosate in herbicide, from agricultural runoff waters.

Description of the Invention

A new absorbent technology simultaneously sorbs phosphate and phosphate-containing pesticides present in low concentrations typically found in agricultural runoff water. The technology is formed through hydrothermal carbonization of agricultural residues (e.g., corn stover), which results in a biomass-based hydrochar that simultaneously sorbs potassium and glyphosate from water in a single, simultaneous and non-competitive step. Removing pesticides and phosphate contamination from water has far reaching environmental and public health applications. For example, it could prevent algal blooms in agricultural run-off and prevent toxicity associated with exposure to even low levels of pesticides)

Features and Benefits

- Simultaneously sorbs phosphate and phosphate-containing pesticides
- Effective on organophosphates, such as glyphosate based-herbicide
- Absorbs low concentrations (e.g., as typically found in agricultural runoff water)
- Economical manufacturing process: hydrothermal carbonization of agricultural residues results in a hydrochar
- Potential to remediate algal blooms in agricultural run-off
- Potential to remediate toxicity associated with exposure to low levels of pesticides

Potential Applications

- Filter medium for agricultural run-off water
- Biomedical applications (e.g., therapeutic agent or medical device to detoxify patients exposed to organophosphate)
- Environmental applications (i.e., preventing algal blooms in agricultural run-off)
- Public health applications (i.e., preventing toxicity associated with exposure to even low levels of pesticides)

Technology Status

Working prototype.

Publications

None

IP Status

Patent Pending

Primary Inventor(s)

Kenneth J. Valentas, PhD
Biotechnology Institute

Contact

Larry Micek
Technology Licensing Officer
612-624-9568
micek013@umn.edu

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