

Improved Natural Sorbents for Toxic Substance Remediation (#7727)

Modification of surface chemistries of natural sorbents improves performance and environmental viability for use in natural disasters.

Researchers from the Georgia Tech School of Materials Science and Engineering have improved the performance of natural sorbents with a new approach to surface modification. This method transforms cellulosic products, such as cotton, into more hydrophobic materials better suited for oil sorption applications. The transformation is achieved by deposition of inorganic species on the product surface using volatile metalorganic precursors. The transformed cellulosic products are able to perform at full capacity in real-world conditions.

Benefits/Advantages

- **Multi-functional** – material offers selective sorption, is biodegradable, and can decompose toxic vapors
- **Greater stability** - material is more stable against UV, hydrolysis, and other environmental factors than organic-based hydrophobicity treatments
- **Simple and efficient** – material can be quickly prepared and manufactured for emergency situations

Potential Commercial Applications

- Environmental emergency or disaster situations
- Substance contamination recovery
- Toxic waste decomposition

Background/Context for This Invention

Remediation methods for natural disasters, such as oil spills, need to consider the physical location of the spill, ecosystem fragility, and economic priorities. Current remediation methods for oil spills meet some of these considerations but fail to address the others. Both natural and synthetic materials are used as sorbents; natural sorbents are more cost-effective and environmentally friendly, but they are not as effective in selective oil sorption due to their hydrophilic nature.

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[Improving Oil Spill Cleanup Materials \(video\)](#)

For more information about this technology, please visit:

<https://industry.gatech.edu/technology/improved-natural-sorbents-toxic-substance-remediation>