Improved Water Purification with More Permeable, Hydrophilic Activated Carbon

UCF researchers have developed an improved water purification method with a composite material of silica nano-gel coated activated carbon, allowing more effective adsorption of impurities than uncoated carbon due to the coatings’ hydrophilic nature.

Background
Activated carbon, considered one of the oldest means of water purification, is an adsorbent created from granules of coal, wood, nutshells or other carbon-rich materials that make it highly effective for water purification because of the porosity and large surface area. As contaminated water flows through activated carbon, the contaminants sorb (stick) to the internal surface area of the granules and remain trapped inside the pore structure of the carbon substrate. This useful aspect of activated carbon is hindered by its surface area chemistry, which repels water and impedes the saturation necessary for water purification.

Currently, carbon filters are used in individual homes as point-of-use water filters and for groundwater remediation, landfill leachate, industrial wastewater and, occasionally, in municipal water treatment facilities.

Technical Details
This new activated carbon is coated with silica to modify the granules so that water passes through more easily, increasing the effectiveness of carbon-based filtration in water treatment systems. The composite material can capture a large selection of color-forming and non-color forming water contaminants ranging from heavy metal ions and organics (azo dyes, drugs, PAHs, humic matter, etc.) to particulates (inorganic, organic, microorganisms).

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Benefits
• Improves water purification results for widespread carbon filtration systems

Applications
• Water purification

Tech Fields
Environmental Remediation

Keywords
activated carbon, silica, dye, azo, water treatment, industrial wastewater, water purification, textiles, colorants, contaminants, filtration, water pollution control

If you or your company are interested in this opportunity, Contact:
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