Design of Novel Scaffolds for Water Filtration by Using Benign and Agriculture Based Precursors

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Dried Distiller's grain with solubles (DDGS) is an abundant by-product of bioethanol and distiller plants with the potential to be developed into cost-effective biocomposites. Rather than wasting the biomass, can DDGS be used to create filtration devices for water essential to growth and life? With very little use, it is crucial to reutilize both DDGS and lignin, another highly abundant yet poorly utilized material, to design highly potential materials effectively. The purpose of this study is to develop a sustainable and cost-effective way to filter water. In addition to creating a water filtration device with green engineering, using local DDGS can boost North Dakota's economy. Creating porous scaffolds composed of benign, pyrolyzed agricultural materials at 300 C and 900 C resulted in the scaffolds being showing hydrophobic and hydrophilic properties. The hydrophobic samples can be utilized for oil spill clean-up, which is essential, especially in North Dakota. Due to its properties, the hydrophilic samples can be used for water filtration. These discoveries are imperative to prevent the growing needs of society from risking harming the environment further.