Synthesizing Biomorphic Batteries Using Porous Plant Stems Using Zinc (Zn) and Copper (Cu) Electroplating Technique

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Chemical-based batteries such as lithium or any conventional battery fall under the label of a chemical battery. Biomorphic batteries are a new prospecting alternative battery that utilizes biological matter to assist with energy conductivity and capacity for future batteries and is reported to be 72 times greater in energy capacity than conventional batteries in the market. Currently, the research of biomorphic batteries is limited, and the basic designs are scattered. This begged whether biomorphic batteries could produce 72 times more energy than conventional batteries and be environmentally friendly, unlike current chemical-based batteries, disregarding other new alternative chemical-based batteries that are also competing for the role. This research aims to recreate a biomorphic battery using the basic structure of a battery, the voltaic (galvanic) cell, and porous plant stems, such as squash, corn cob, pumpkin, and sunflower stems as the biological component of the battery. The most stable biomorphic battery is the squash stem since the battery is durable in energy production compared to the other biomorphic batteries but is considerably dwarfed by the conventional lithium battery used as a comparison. This demonstrated that biomorphic batteries could outrank a chemical battery but will need more resources and studies done. This paper did not investigate these biomorphic batteries' energy capacity and density. Still, it will be a consideration in future battery improvements, and ultimately, the batteries will stem towards a more typical battery structure.

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