**Paper battery**

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**Abstract**

*A paper battery is a flexible, ultra-thin energy storage and production device formed by combining carbon nanotubes s with a conventional sheet of cellulose-based paper.  A paper battery acts as both a high-energy battery and super capacitor. Paper batteries may be folded, cut or otherwise shaped for different applications without any loss of integrity or efficiency.  begins with growing the nanotubes on a silicon substrate and then impregnating the gaps in the matrix with cellulose. Once the matrix has dried, the material can be peeled off of the substrate, exposing one end of the carbon nanotubes to act as an electrode . When two sheets are combined, with the cellulose sides facing inwards, a super capacitor is formed that can be activated by the addition of the ionic liquid. This liquid acts as an electrolyte and may include salt-laden solutions like human blood, sweat or urine. The high cellulose content (over 90%) and lack of toxic chemicals in paper batteries makes the device both biocompatible and environmentally friendly, especially when compared to the traditional lithium ion battery used in many present-day electronic devices and laptops. Specialized paper batteries could act as power sources for any number of devices implanted in humans and animals, including RFID tags, cosmetics, drug-delivery systems and pacemakers. A capacitor introduced into an organism could be implanted fully dry and then be gradudally exposed to bodily fluids over time to generate voltage. Paper batteries are also biodegradable, a need only partially addressed by current e-cycling and other electronics disposal methods increasingly advocated for by the green computing movement.*