New technologies at high-speed train pace

Breakthrough: Supercapacitors with higher energy density

Mobile systems with built-in storage systems are highly up-to-date and can be found on laptops, mobile phones, garden tools and cars, among others. In addition to the storage elements batteries and accumulators, supercapacitors are again used. However, the energy density of supercapacitors is only 10 percent of Li-ion accumulators (up to 256-watt hours per kilogram (Wh/kg)). Researchers have now succeeded in developing a successful, powerful and sustainable graphene hybrid material for supercapacitors, serving as a positive electrode in the energy storage. The researchers combined it with an already known and proven negative electrode of titanium and carbon. This technology already achieves an energy density of up to 73 Wh/kg. This is roughly equivalent to the energy density of a nickel-metal hybrid battery. Researchers are now relying on such hybrid materials to extend the previous performance limits for the better. A classic lithium-iron phosphate battery (LiFePo) has a lifespan of approximately 2000 cycles.

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