

# Researcher discovers new materials

July 10 2006

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A research team led by Carnegie Mellon University Materials Science and Biomedical Engineering Professor Prashant Kumta has discovered a nanocrystalline material that is cheaper, more stable and produces a higher quality energy storage capacity for use in a variety of industrial and portable consumer electronic products.

Kumta said the discovery, published this summer in *Advanced Materials Journal*, has important implications for increasing the longevity of rechargeable car batteries, fuel cells and other battery-operated electronic devices.

"We have found that synthesis of nanostructured vanadium nitride and controlled oxidation of the surface at the nanoscale is key to creating the next generation of supercapacitors commonly used in everything from cars, camcorders and lawn mowers to industrial backup power systems at hospitals and airports," Kumta said.

Dramatic growth in computer use is making consumers require more from their electronic devices, which creates increased demand for a better power source than existing battery technology. Today's batteries are also powered by ruthenium, which sells for \$100 per gram, compared with the more economical vanadium nitride at \$50 a gram.

"Not only is vanadium nitride less expensive to use, it can also store energy much longer, giving users a greater burst of juice for the old finicky car battery or the hospital's backup power system," Kumta said.

As people use cell phones to do more than just communicate -- as they watch movies, listen to music and process family photos -- they need more power. And this new nanocrystalline will solve some of those challenges, according to Kumta.

Source: Carnegie Mellon University

Citation: Researcher discovers new materials (2006, July 10) retrieved 29 January 2023 from <https://phys.org/news/2006-07-materials.html>

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