

Title:
**North Carolina researchers reveal how water based
'artificial leaf' generates electricity**

Were you aware that a North Carolina State University staff has demonstrated that water gel-based solar devices (named: "artificial leaves") can work like solar cells to generate electricity?

The research has been published on-line in the Journal of Materials Chemistry by Doctor. Orlin Velev, an Invista Professor associated with Chemical and Bio-molecular Engineering.

The studies prove the concept for making solar cells that more closely imitate nature. They also have the possibility to be less costly and more beneficial to our environment than the recent standard silicon based solar cells.

The bendable devices are composed of water-based gel infused with light-sensitive molecules (like plant chlorophyll) coupled with electrodes coated by carbon elements, such as carbon nanotubes or graphite.

Graphene is the basic structural element of some carbon allotropes including graphite, carbon nanotubes and fullerenes. Graphene is a 1-atom thick planar sheet of carbon atoms that are largely packed in a honeycomb crystal lattice. The name comes from graphite ene; graphite itself consists of many graphene sheets piled together.

The light-sensitive molecules get "excited" by the sun's rays to generate electricity, similar to plant molecules that get excited to synthesize all kinds of sugar in order to grow.

Dr. Velev affirms that the analysis team hopes to be able to "learn how to mimic the materials where nature harnesses solar power." Although synthetic light-sensitive molecules can be used, Velev says naturally extracted products, like chlorophyll, are also very easily integrated in these products because of their water-gel matrix.

Velev even imagines a future where homes could be covered with soft sheets of similar energy-generating man-made-leaf photo voltaic cells. The concept of biologically inspired 'soft' units for generating electricity may well in the future offer an alternative for the present-

day solid-state technologies.

About the Author: Colleen J. McGuire produces for the solar fountains reviews blog, her personal hobby web log focused on recommendations to help homeowners to spend less energy with solar power.

Reference: Aqueous soft matter based photovoltaic devices. Journal of Materials Chemistry, 2011; DOI: <http://pubs.rsc.org/en/Content/ArticleLanding/2011/JM/c0jm01820a>