

# Clathrate Compounds and Method of Manufacturing

**R**esearchers at the University of South Florida have developed a novel material that is capable of converting both sunlight and heat into electrical energy.

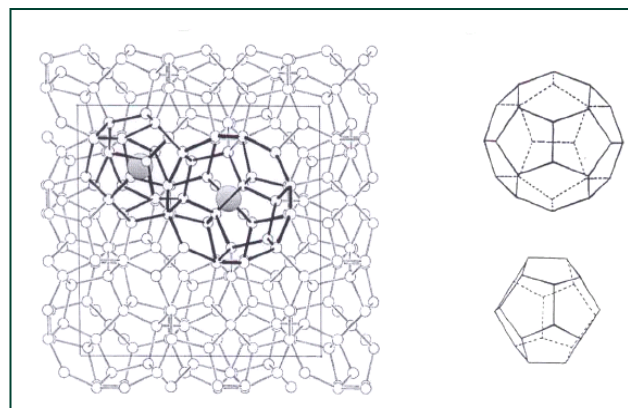
Technologies that convert solar energy into electricity hold great promise as effective energy sources that will contribute to the rising global energy needs. However, current solar conversion technologies are not cheap enough nor do they possess the required efficiency to contribute significantly to the world's electricity needs. The most effective way to realize large scale solar energy conversion will be to develop vastly improved materials that will have both higher light to electricity conversion efficiency as well as reduced manufacturing costs. An additional way to improve solar conversion technologies may be to create a material that is also capable of converting heat energy from the sun into electricity. In order to make solar energy conversion a cost effective means of providing electricity worldwide, new materials must be developed which can convert both solar and heat energy into electricity.

USF inventors have addressed this need by creating a new material that can convert both heat and light into electricity. The material is composed of a compound known as a clathrate crystal, which has special properties that allows it to capture heat and light energy. The inventors have also established a straight-forward method of manufacturing this electricity generating material, both in bulk form as well as thin film form. The thin film is specifically useful for solar energy conversion. This invention is a significant development in solar conversion technology and it has potential to contribute to the global renewable energy development efforts.

### ADVANTAGES:

- Generate electricity from heat and light
- Can be processed into bulk material or thin film
- Capable of integrating into current solar technologies

*New Material for Economical Harnessing of Solar Energy*



*Crystal Structure of the Clathrate Material (Left) and the Individual Polyhedra it is Composed of (Right)*

**Tech ID # 05B091**

**Patent #s: [7,534,414](#) / [8,211,400](#)**

University of South Florida | Technology Transfer Office  
813.974.0994 (office) | 813.974.8490 (fax)  
patents@research.usf.edu  
<http://www.usf.edu/research-innovation/pl/>