

## Technology Overview

Title: Fluorinated Aromatic Materials and their use in Optoelectronics

Reference:	0927
Summary:	Researchers at the University of South Dakota have designed and synthesized new fluorinated aromatics for stable, efficient, and moisture-resistant fluorinated optoelectronics.
Description:	Optoelectronics are used in many state-of-the-art materials including active matrix liquid crystal displays, lithium ion batteries, and proton exchange membranes for fuel cells. They are also found in Organic Solar Cells (OSCs), Dye-sensitized Cells (DSSCs), Organic Light Emitting Diodes (OLEDs), and Organic Field-effect Transistors (OFETs) but the way they are currently constructed, they are neither flexible nor resistant to shock and vibration. The unique application of Fluorinated Aromatic Materials within Optoelectronics is the key to the wide deployment of next generation of light weight and highly efficient optoelectronics. This research replaces fragile elements in current optoelectronic designs and provides high stability tolerance in extreme environmental conditions, with profound effects upon tuning the electronic and optical properties of organic semiconductors. These new fluorinated aromatics are a breakthrough for their stability, efficiency, and moisture-resistance in optoelectronics along with their low cost and high efficiency.
Advantage:	<ul style="list-style-type: none"><li>-- Increased flexibility and shock and vibration resistance</li><li>-- More stable in extreme environmental conditions</li><li>-- Lower cost than comparable Hydrocarbon-based organic semiconductors</li><li>-- Less flammable than comparable Hydrocarbon-based products</li><li>-- Increased efficiency through the prevention of moisture permeation</li></ul>
Application:	Organic Solar Cells, Optoelectronics, OLEDs, OFETs
Stage:	Concept proven. Additional testing and configurations under development.
Patents:	Provisional application
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Keywords:	Optoelectronics, Fluorinated Aromatic Materials, Flexible, Shock and Vibration Resistant, Increased Efficiency, OLED