Researchers at the University of South Florida have developed a low cost novel smart material that changes color rapidly without any external energy stimulus. It can be used for many applications from building windows to various displays.

Windows are responsible for 30% of the heating and cooling loads in buildings. Thin film coatings on glass with color change capabilities could reduce energy consumption by reflecting unwanted radiation and transmitting needed radiation during daylight hours. Smart windows using electrochromic, liquid crystal, and photochromic technologies still relatively new. The market for smart glass is estimated to grow at a rate of 30% annually therefore an opportunity exists for a company that can produce a chromatic device that is both effective and less expensive.

USF inventors have successfully developed a smart material technology using low cost materials. No external energy is needed to affect color change. In one application, the material is opaque under normal conditions. When contacted with a certain metal, it becomes transparent in seconds. The use of various materials and chemical concentrations are employed to obtain a variety of intensities and rates of color change.

The patent pending technology may be utilized for commercial, residential, and transportation window applications. In addition, this technology is applicable in optical filters, marine, aircraft windows, toys, display products, and electronic devices.

**ADVANTAGES:**
- Cost effective
- No need for electrical energy
- Large surface area applications
- Rapid color change
- Provides energy savings

**Demonstration of Color Change**

*Figure 1. (1) A film with the electrolyte, (2) a metal pin touches the film, (3) the color changes in a few seconds, (4) the metal contact is removed, and (5) the color is restored.*

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