

# The Office of Technology Management

UNIVERSITY OF TEXAS  ARLINGTON

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## Ferroelectric-Electrochromic device using e-WO<sub>3</sub>

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### TECHNOLOGY NEED

Tungsten trioxide (WO<sub>3</sub>) is a known electrochromic material that exhibits a wide range of colors. Currently, electrochromic devices that utilize WO<sub>3</sub> require both an ion storage layer and an electrolytic layer to induce coloration. The inclusion of such layers in the design and manufacturing of an electrochromic device is costly and can be problematic. The need exists for a simple, efficient, and cost-effective electrochromic device that does not involve ionic transport.

### INVENTION DESCRIPTION/SOLUTION

A novel cost-effective and improved electrochromic device is presented herein. The device incorporates the epsilon-phase of tungsten trioxide ( $\epsilon$ -WO<sub>3</sub>), which exhibits both electrochromic and ferroelectric properties and is suitable for use in a variety of switching applications. The device does not use ion storage layers, electrolytic layers, and/or lithium and other metals usually found in the conventional electrochromic devices. The  $\epsilon$ -WO<sub>3</sub>-based devices are simpler, less expensive, and easier to manufacture compared to conventional electrochromic devices.

### APPLICATIONS

- Electrochromic device
- Non-volatile memory applications (transistors, semiconductors, FRAM, PRAM etc.)

### KEY BENEFITS

- Visualized polarization switching
- Scalable production capacity
- Exhibits both ferroelectric and electrochromic properties
- Cost effective/easy to manufacture

### STAGE OF DEVELOPMENT

Lab Prototyped

### INTELLECTUAL PROPERTY STATUS

Provisional



**More about the inventor**  
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#### Contact information

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