



Fabrication of Electrochromic Tungsten Oxide Films for Optical Modulation

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Summary: Mesoporous tungsten oxide films that are capable of modulating optical transmission up to the theoretical limit of 100% in the visible regime

Description: Smart windows are solar control devices that can electronically regulate the flow of sunlight and heat. The U.S. Department of Energy has estimated that the use of smart windows could reduce peak electric loads in buildings by 20-30%; however, cost and unsatisfactory performance are two issues that limit wider adoption of this technology. The present invention describes a unique chemistry and fabrication approach that produces mesoporous tungsten oxide films capable of modulating optical transmission up to the theoretical limit of 100% in the visible regime (>550 nm). The novel process is based on adopting established sol-gel chemistry to ultrasonic spray deposition (USD). USD is performed under ambient conditions as opposed to high vacuum sputtering (the standard commercial process), and as such is more amenable to in-line, high volume, low cost manufacturing.

Main Advantages of this Invention

- 100% optical modulation
- Lower production costs
- Fast switching kinetics (75% change in absolute transmission in ~3 sec.)
- Amenable to in-line, high volume manufacturing

Potential Areas of Application

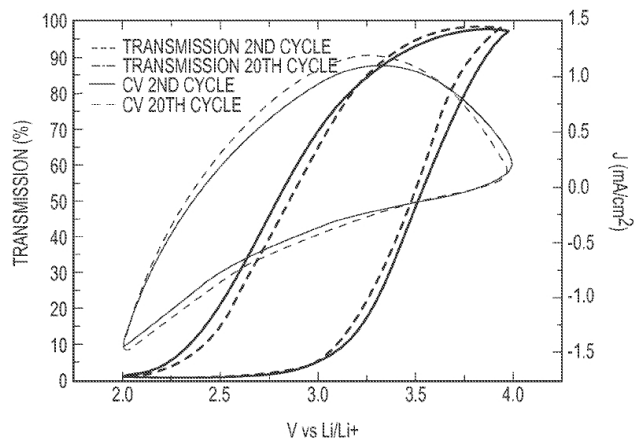
- Green Engineering
- Window Manufactures

ID number: 14005

Intellectual Property Status: US utility patent pending (application #14/700,287)

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Opportunity: We are seeking an exclusive or non-exclusive licensee for marketing, manufacturing, and sale of this technology.



Cyclic voltammograms (left) and optical transmission at 670 nm recorded in registry (right)

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