



SDI Review Form 1.6

Journal Name:	Physical Review & Research International
Manuscript Number:	2013_PRRI_5663
Title of the Manuscript:	Improvement in Gasochromic Properties of Tungsten Trioxide by Optimized Pd Doping
Type of the Article	Research Paper

General guideline for Peer Review process:

This journal's peer review policy states that **NO** manuscript should be rejected only on the basis of '**lack of Novelty**', provided the manuscript is scientifically robust and technically sound.

To know the complete guideline for Peer Review process, reviewers are requested to visit this link:

(<http://www.sciencedomain.org/page.php?id=sdi-general-editorial-policy#Peer-Review-Guideline>)



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PART 1: Review Comments

	Reviewer's comment	Author's comment (if agreed with reviewer, correct the manuscript and highlight that part in the manuscript. It is mandatory that authors should write his/her feedback here)
Compulsory REVISION comments	The manuscript needs to be completely rewritten by somebody who is well versed in English or whose first language is English. It is written in a language that can distort the meaning and make it difficult for the reader to follow the idea.	We did our best
Minor REVISION comments		
Optional/General comments	<p>Hardly any physics related to the electrochromic coloration. Very superfluous discussion.</p> <p>WO₃ electrochromic coloration is very well known and this coloration is concentrated in the near infrared and higher visible regions. Why is the coloration in the present case uniform throughout the spectral region studied. The mechanism of coloration should be explained.</p> <p>Some interesting points concerning speed of coloration.</p> <p>The structure needs to be modified for making it easier to grasp.</p>	<p>The mechanism of coloration is explained in the text. As it says: The adsorbed H₂ molecules dissociate on the Pd layer and transfer to the WO₃ surface, forming W-OH groups. Diffusion models predict that two protons, instead of a single one, interact with W to form H₂O. Water formation generates vacancies for WO₂ and oxygen. Coloration proceeds from the diffusion of these oxygen vacancies in the surface into the interior of the film. Experimental results reveal that coloration is fast and exponential.</p> <p>Bleaching is a reverse process where the O₂ dissociates on the Pd catalyst, and diffuses into the interior of the film, recombining with the oxygen vacancies and reforming the WO₃. This process requires a film with a large surface area. The increased number of W=O bonds observed in colored films can be explained by the breakage of the W-O-W bonds by the formation of H⁺...OW⁻ bonds. This is similar to the formation of the x (Li⁺...OW⁻) and $\frac{W_{x+6}W_{x+5}O_3}{-x}$</p>



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		<p>species proposed for electrochemically colored WO_3 films. According to Faughman theory, the coloration of WO_3 thin films occurs because of the valence change in tungsten ($\text{W}^{+6}-\text{W}^{+5}$) that causes ray absorbance and the diffusion of electrons and positive ions into the WO_3 lattice that completes the coloration process.</p>
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