**Listening Exercise 116**

News Story, Technology

1 min 29 seconds

¡Que bueno estudiar! ☺

Guidelines:

A. Review the questions

C. Listen to the audio twice (double click the WMA audio icon)

D. Answer the questions

F. Refer to the answers and transcript to confirm your responses and gauge understanding

G. Listen to the audio again while simultaneously reading the audio transcript.



**Questions**

1. Which best describes the main topic?
   1. Manufacturer recall
   2. Scientific research
   3. Effects of light
   4. Architecture
2. How is this development different from existing methods? Choose all that apply.
   1. More efficient
   2. Achieves new result
   3. Effective on large areas
   4. Cheaper
3. What is notable about this method?
   1. Requires special tools to install
   2. Works with one push of a button
   3. Uses a toxic spray
   4. Effective on crystal chandeliers
4. How does voltage affect the material?
   1. Roughens
   2. Hardens
   3. Softens
   4. Thins
5. What happens to light?
   1. Stretches
   2. Scatters
   3. Penetrates
   4. Burns
6. What will happen to the persians mentioned?
   1. Get shorter
   2. Transfer more light
   3. Become a thing of the past
   4. Evolve in the future

**Transcript**

La universidad de Harvard trabaja en el desarollo de una ventana que podría cambiar de tonos de color e intensidad de luz. Esta nueva tecnología podría tener un enorme impacto en la fabricación de ventanas para hogares, oficinas, y hospitales.

El cambio de color no es nuevo, ya existe. Pero dependen de reacciones electroquímicas que son costosas para fabricar, especialmente al nivel comercial.

“Son muy efectivas aunque las nuestras son aún más efectivas. Pero el problema es en como uno crea áreas grandes, ventanas, y a costo.”

David Clark y Sam Sheehan de la escuela de ingeniería de Harvard han encontrado la forma de producir ventanas que van de claro a opaco con el sólo oprimir un botón. El equipo rocia nano alambres a ambos lados de una goma de elastómera para luego pegarla a crístal.

“Al aplicarles un voltaje relativo a un trasfondo hay una fuerza atractiva entre los nano alambres y el substrato que de forma el elastómero, la goma de elastómera es muy suave, que luego se transforma en una muy áspera que esparce la luz.“

Mientras más voltaje se aplica más luz esparce y más se opaca la ventana. Una vez optimizada, ventanas asequibles que pueden oscurecerse en sólo un segundo serán una realidad mientras que las cortinas y persianas pasarán a ser parte de la história.

**Vocabulary**

Electroquímica electrochemical

Opaco opaque

Nano nano, micro

Substrato substrate

Áspera rough

Esparce scatter

Optimizada optimized

Asequibles affordable

Persianas Persian blinds, Venetian blinds

Elastómera elastomer (elastic polymer= rubber)

**Transcript**

Harvard University is working to develop a window that could change color tones and light intensity. This new technology could have a huge impact on the manufacture of windows for homes, offices, and hospitals.

Changing the color is not new, it already exists. But relys on electrochemical reactions that are expensive to manufacture, especially on a commercial level.

“They are very effective but ours are even more effective. But the problem is in how one creates large window areas, and at cost.”

David Clark and Sam Sheehan of the engineering school at Harvard have found a way to produce windows that go from clear to opaque with only the push of a button. The team sprayed nanowires to both sides of a rubber elastomer to then stick it to glass.

“By applying voltage to a background there is an attractive force between the nanowires and the substrate so that the elastomer, the rubber elastomer is very soft, becomes very rough and scatters light.”

The more voltage that is applied the more light scatters and the window gets darker. Once optimized, affordable windows that can be blacked out in just a second will be a reality while curtains and Persian blinds will become part of history.