PHOTOCHROMIC POLYMERS

Intelligent windows, photosensitive visors, invisible safety products, dynamic windshields... All this is possible with photochromic polymers applied to easily obtainable moldable matrices.



Laboratory Idea

Prototype

Scale-up

Market





Description

Polymers whose color and transparency change in response to UV light or electric current, otherwise maintaining their original color / transparency. Available in liquid and solid form.



Problem

The development of materials that help optimize light in closed spaces has gained ground, although technologies for this purpose are scanty. The production of photosensitive glasses is hampered by their melting temperature. The existing photochromic polymers contain high concentrations of the elements responsible for altering transparency/color, which increases costs and reduces transparency. Matrices containing these elements are usually solid or semi-solid, making their application on irregular surfaces difficult or unfeasible. Moreover, the process for obtaining these compositions is complex and costly.



Benefits

These materials can maintain their change in color for longer periods. Faster speed of color reversal. Their low concentration of photosensitive elements enables them to maintain their transparency. Incorporation of photosensitive material in a liquid matrix, at low temperatures, allows for application on irregular surfaces and glasses. The material blocks UV and infrared radiation. This technology involves a simplified process, thereby reducing production costs.



Market potential

The U.S. glass industry accounts for a revenue of about US\$2.2 billion, and one of its priorities for the special glasses segment is the development of intelligent windows. The main manufacturers are concentrated in the U.S., Japan and the European Union.

The worldwide market for corrective eyeglass lenses involves revenues of about EUR 8 billion, and there is a possibility for entering this market, although there are already alternatives.



Proposed solution

The technology consists of incorporating photochromic and electrochromic materials into commonly used polymers. These materials are incorporated in relatively small concentrations and at low temperatures. The matrices can be incorporated into paints and varnishes or they can be transformed into the solid state in a variety of shapes.



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