Press Release

Hohenstein Institute's research towards a colourful future

The development of photochromic textile prints opens the way for new product ideas

BOENNIGHEIM (im/ri) Glass lenses that darken depending on the presence of sunlight - a well-known example of the current use of the photochromism effect. Photochromism describes the ability of molecules to change from a colourless to a colourful form with the addition of UV radiation, and to reverse this process in the absence of light. Photochromism is already used in toys and fashion accessories.

Now there are also plans to enable textiles to change colour depending on sunlight, and therefore set the stage for completely new products. Researchers at the Hohenstein Institute in Boennigheim are working on developing photochromic textile materials.

Dr. Jan Beringer, head of research at the Function & Care department, foresees a number of different application options, such as self-darkening curtains, sunshades and blinds: "One should also not underestimate the opportunities this may create for the clothing industry. In addition to creating a considerable number of fashion effects, it is also conceivable that such materials are used to carry out useful functions such as increasing UV protection by changing the colour of the garment (depending on the situation). By developing such innovative products, the German clothing and home textile industry is taking another enormous know-how step towards the future."

Project manager Dr. Edith Claßen from Dr. Beringer's research team also thinks that these research results can be transferred to other materials: "Photochromic lacquers and glass coatings with intelligent functions could be very interesting for the automotive industry, for example. In this case, a change of colour can serve a protective function, whereby the material automatically converts into a signal colour upon dusk or bad weather conditions.

At this point, the researchers are still at the beginning of their work, however. Based on initial sample materials, the photochromic molecules "tire" after a period of time, and the textiles do not change colour, or only with a considerable delay. There are plans to better protect photochromic systems against this "tiring" effect by using photo-oxidation - a chemical reaction using light and oxygen.

Hohenstein Laboratories
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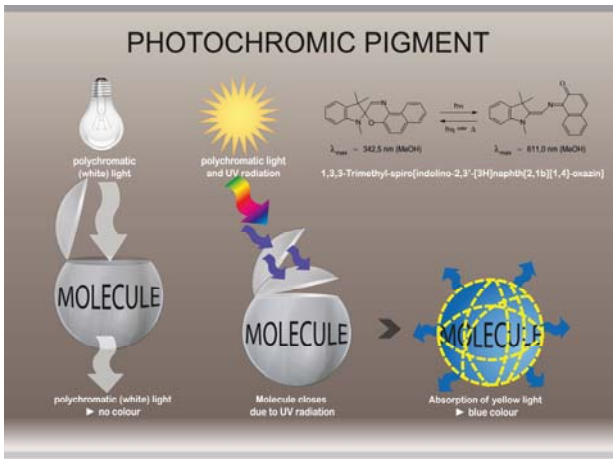

When working with photochromic pigments, Hohenstein researchers take advantage of the effects of the subtractive colour mixture: UV radiation causes the molecular bonds in photochromic pigments to change. The yellow portions are subsequently filtered out of the incident white light, so that observers now perceive the formerly invisible/colourless pigment as blue.

Graph: Hohenstein Institute

The pattern printed on this child's T-shirt only appears in the presence of UV radiation (right).

Photograph: Oeko-Tex®

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