Textile screen-printed with photochromic ethyl cellulose-spirooxazine composite nanoparticles

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Summary

Photochromic compounds change their colour due to electromagnetic radiation reversibly. The use of photochromism on fabrics can provide new opportunities to develop smart textiles, e.g. sensors and active protective clothes. Ethyl cellulose-1,3-Dihydro-1,3,3,4,5 (or 1,3,3,5,6)-pentamethyl-spiro-[2H-indole-2,3'-[3H]naphtha[2,1-b][1,4]oxazine] composites were prepared by an oil-in-water emulsion, solvent evaporation method in order to form in screen printing paste easily suspendable and fatigue resistant photochromic nanoparticles. Their size was well below 1 μm and did not change substantially in a wide range of dye concentration. After thermal screen printing homogenous photochromic layer was built, which represented substantial colour development in CIELAB colour space measurements due to UV light even at a concentration of 0.045 % *w/w*. Addition of photodegradation inhibitor, Tinuvin 144 further increased the colouration of printed fabric.