

Antiviral and antibacterial textiles functionalized with natural biologically active dye

Fields of use

Filtration, climatization, ventilation. Protective clothing for medical workers, laboratories, sports...

Current state of technology

Technology confirmed in the laboratory (TRL 4)

Intellectual property

Patent Application No. LU500249 in Luxembourg

Developed by

University of Ljubljana, Faculty of Chemistry and Chemical Technology

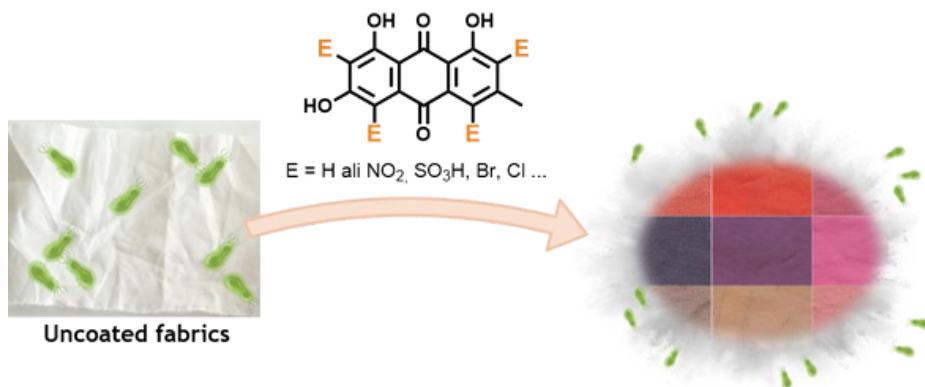
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Background

Antimicrobial functionalization of textile materials used in everyday and life applications is extremely important as it reduces microbial infections, decreases unpleasant odours and prolongs the life of consumers' products. Emodin is a natural yellow pigment found in many plants, lichens, and moulds. It is a biologically active compound and a potential source for functionalizing textiles, ensuring antimicrobial properties.

Description of the invention

We have developed functionalized coloured textiles with antiviral and antibacterial properties based on emodin and its derivatives. Emodin was chemically modified by introducing different functional groups that affect its colour, textile adsorption, antibacterial (MSSA) and antiviral (human coronavirus NL63, the best model for SARS-CoV-2) properties. The different colours of the new compounds, their good binding properties and their antiviral and antibacterial activities represent a great potential for their use in various products such as filters, ventilation systems, protective clothing for medical personnel and laboratories, sports equipment, etc.

Main advantages

- Easy modification of the natural dye and active ingredient emodin.
- Emodin and its derivatives yield a wide range of dyes from yellow, orange, violet to brown.
- Modified emodin compounds can be easily incorporated into textile materials. Adsorption of dyes is excellent, and its washability is high.
- Emodins have excellent antiviral activity against human coronavirus HCoV-NL63 (similar to SARS-CoV-2).
- Textile materials functionalized with emodin have antibacterial activity against *S. aureus* (MSSA).