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TEXTILE MODIFIED WITH A PHOTOACTIVE AGENT FOR FUEL DESULFURIZATION

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The presence of sulphur compounds in fuels is ecologically dangerous because they can be converted to sulphur dioxide (SO2) during processing and combustion. Sulphur dioxide forms with water vapour acid rain, which harms agriculture, buildings, and all ecosystems. The removal of aromatic sulphur compounds is most often done by oxidation. These processes convert them to water-soluble sulphones that can be easily removed by extraction with water.

Singlet oxygen reacts with unsaturated and aromatic compounds and oxidizes compounds containing sulphur, selenium, phosphorus, and nitrogen.

Under specific conditions, such as exposure to light, photosensitive compounds react with oxygen to produce reactive oxygen species. One of the resultant products under these conditions is singlet oxygen.

Textile materials offer a range of benefits when used as carriers of photoactive compounds. The resulting composites are lightweight, flexible, and easy to apply. Importantly, they do not require hydrogen peroxide, ozone, or other oxidants, and their action can be controlled over an extended period. Polyester materials, with their excellent chemical resistance, are particularly suitable as a matrix for photosensitizers. They are commonly used in the production of filters, where strength, flexibility, and stability are crucial. Their key advantage is the possibility of recovering from the treated fuel and reusing it.

This study aims to prepare a new textile material modified with a photoactive agent and to investigate its application for fuel desulfurization.

***Keywords**: textile, desulfurization, fuel, singlet oxygen.*

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