

Photocatalytic disinfection of small scale PPEs (gloves, head cover, goggles)

Category: Personal protective equipment

Objectives of the proposal:

To disinfect the small scale PPEs used in hospitals, used by police, health care workers.

How it works: Disinfection of small scale PPEs is proposed through a photocatalytic mechanism using UV-C light. Kaolinite supported TiO_2/ZnO catalysts suspended in water medium will be irradiated using UVC light. The wavelength of UVC light lies between 200 and 280 nm; this range of spectrum has disinfection properties and generally are reported as “ultraviolet germi-cidal irradiation” (UVGI). This source of light directly affects the DNA and RNA by prompting molecular transformations.

It is believed that the TiO_2 coupled UV processes can be an effective tool to reduce the dissemination of the SARS virus [Han et al. 2004]. Coupling clay with the catalyst usually results in increased adsorption of VOCs generated from the disinfection processes. Small scale PPEs are dropped to the clay coupled photocatalytic solution irradiated using series of LED lamps while in agitation. Performance will be monitored through characterization.

Optimized bench scale experiments using the photocatalyst with an array of LED lamps will be carried out.

Expected Time-line: 4 months

Funding requirement -Rs. 20,000/-

URL: <https://www.nitt.edu/home/academics/departments/chem/chemfaculty/aoprof/sheeba/>

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