

ECONOMICAL & SAFE MATERIAL FOR PRODUCED WATER DISINFECTION



INVENTION

This invention is about a photo catalyst for disinfection of waste water contaminated with bacteria (e.g. Sulfate Reducing Bacteria (SRB)). The material can be applied as a powder or coating in desired storage and exposed to light photons to activate chemical reactions. It can also be used for air purification.

MARKET SIZE AND GROWTH

Waste water is produced from several industrial applications such as crude oil production and refining. Oil wells containing Sulphur create opportunity for SRB growth. These bacteria cause corrosion and production of H_2S , a dangerous gas. Moreover, governments around the world require treatment of the waste or produced water before disposal or reuse.

Methods such as boiling, ozonation, chlorination, UV, membrane filtration, reverse osmosis, humidification, and catalysis are used for water treatment. The current invention make use of a photocatalyst.

The global market value for photocatalyst was US\$ 2.5 billion in 2018. It has been projected to reach a value of US\$ 6 billion by 2029¹. Applications based on market landscape include air purification, water purification, and self-cleaning². The high demand in photocatalysts for air purification, COVID-19 fighting, and water disinfection is the main market driver.

APPLICATIONS

The technology is useful for treatment and disinfection of water, air and surfaces. The large volume of produced water in oil and gas is a potential opportunity.

ADVANTAGES

- Safe and environmentally friendly
- Lower cost compared to other methods
- Raw material is locally available
- Less energy consumption

PROJECT STATUS

- Materials synthesis and testing was carried out in lab.
- The photocatalyst can disinfect water at a decay rate constant of 5.4/min.

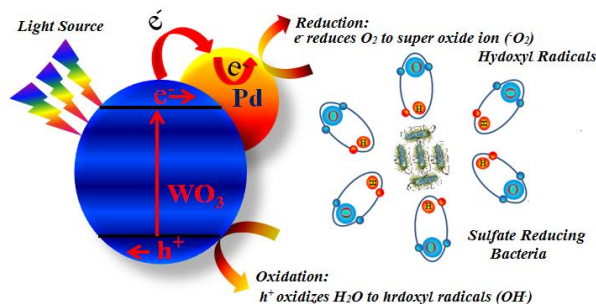


Fig. Graphical illustration of the photocatalytic sterilization of SRB

LOOKING FOR DEVELOPMENT PARTNER

We are looking for industry feedback on testing the current technology with any benchmark. We are also looking for a company who can partner with us to develop the technology readiness level and scaling up the process. Our ultimate objective is to license the intellectual property (IP) to a company for commercialization.

PATENT PROTECTION

Patents US10125031, US10160665, and US10421672 cover the method and apparatus. The IP is owned by King Fahd University of Petroleum & Minerals (KFUPM).

ABOUT KFUPM

KFUPM is located in Dhahran city of Saudi Arabia. KFUPM currently ranks at 163 in QS World University Rankings 2021. KFUPM's Innovation & Technology Transfer office strives for taking innovation from lab to market place.

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¹<https://www.persistencemarketresearch.com/>

²<https://www.grandviewresearch.com>