

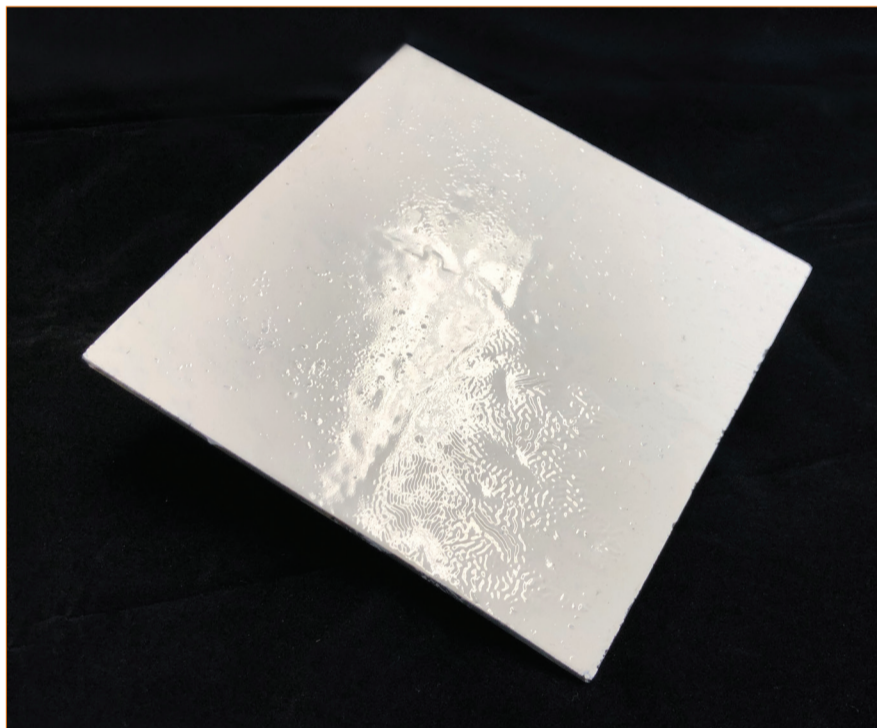
Whitewash：能把空氣和水淨化消毒的強效光催化劑

Whitewash: Powerful Photocatalyst for Air and Water Purification and Disinfection

分解有害氣體及殺滅細菌、病毒

Breaking down harmful gases and killing bacteria and viruses

Whitewash塗層含有加入石墨烯的二氧化鈦納米纖維光催化劑，能讓光線、有害氣體、細菌及病毒通過，進而接觸當中的納米纖維。當塗層吸收到足夠光線能量後，光子電子及電洞會與空氣中的氧氣及水氣發生反應，然後產生大量自由基。通過氧化作用，自由基會將有害氣體轉化成無害物質，同時殺滅細菌及病毒氧化。



塗上Whitewash的玻璃磚
Whitewash coated on glass tile

“Whitewash” is a proprietary coating with titania composite nanofiber photocatalyst with graphene. The coating allows light, harmful gas molecules, bacteria and viruses to pass through to be in contact with the nanofibres. Upon light harvest, photogenerated electrons and holes that react with oxygen and water vapor in air produce large amounts of radicals. By oxidation, the radicals convert harmful gases to harmless substances and kill bacteria/viruses.

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專利號碼: 8,987,706 B2 (美國)

特色與優點

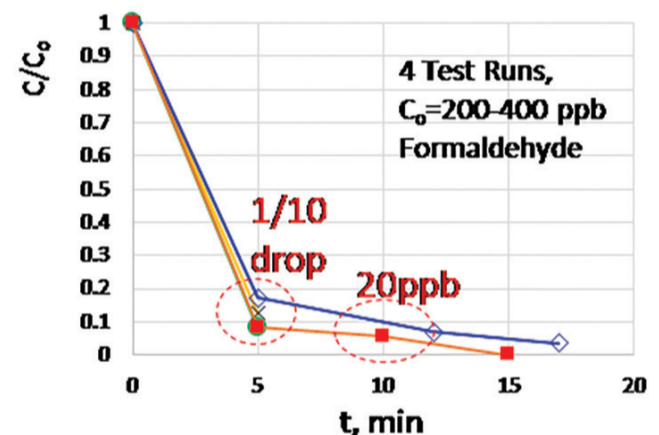
- 能讓光線、氣體、細菌及病毒滲進塗層，同時讓已轉化的無害氣體釋出
- 效果持久及可重用，納米纖維不會被消耗，因此不需補充
- 納米纖維被封於塗層中，不會飛散到空中而被吸進呼吸道
- 可清洗，亦可用於水中，以氧化水中的有害物質
- Whitewash 與現有的25 nm 二氧化鈦光催化劑相比，甲醛的轉化率為後者的3倍，一氧化氮的轉化率為後者的2倍

應用

- 淨化空氣和水，例如加於空氣清新機
- 用作浴室、廚房、病房、電梯和車廂等封閉空間的玻璃/瓷磚塗料，以殺滅病毒和細菌和分解有害揮發性有機化合物

獎項

- 國際先進材料協會大獎 (2019年6月)



Whitewash能於10分鐘內將150升空間內的300至400 ppb甲醛減少至20ppb（正常的室內濃度）
Whitewash is capable of purifying 300 – 400 ppb of formaldehyde in 150 litres volume environment in 10 minutes, reducing the concentration to less than 20 ppb, a normal level in an indoor setting

Patent No.: 8,987,706 B2 (US)

Special Features and Advantages

- Allow light, gas molecules, bacteria and viruses to diffuse into the coating, and harmless converted gases to diffuse out
- Durable and reusable, without consumption of the nanofibres and replenishment need
- Nanomaterials all contained, causing no concern on inhaling
- Washable and can be used in water to oxidize harmful organic molecules in water
- Three times better in converting formaldehyde and two times better in converting nitric oxide when compared to 25-nm TiO₂

Applications

- Air and water purification, e.g. in air purifiers
- Glass/ceramic tile coatings for enclosed spaces such as bathrooms, kitchens, hospital wards, elevators and vehicle cabins for killing viruses and bacteria or breaking down harmful volatile organic compounds

Award

- IAAM Award - International Association of Advanced Materials Sweden, (Jun 2019)



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