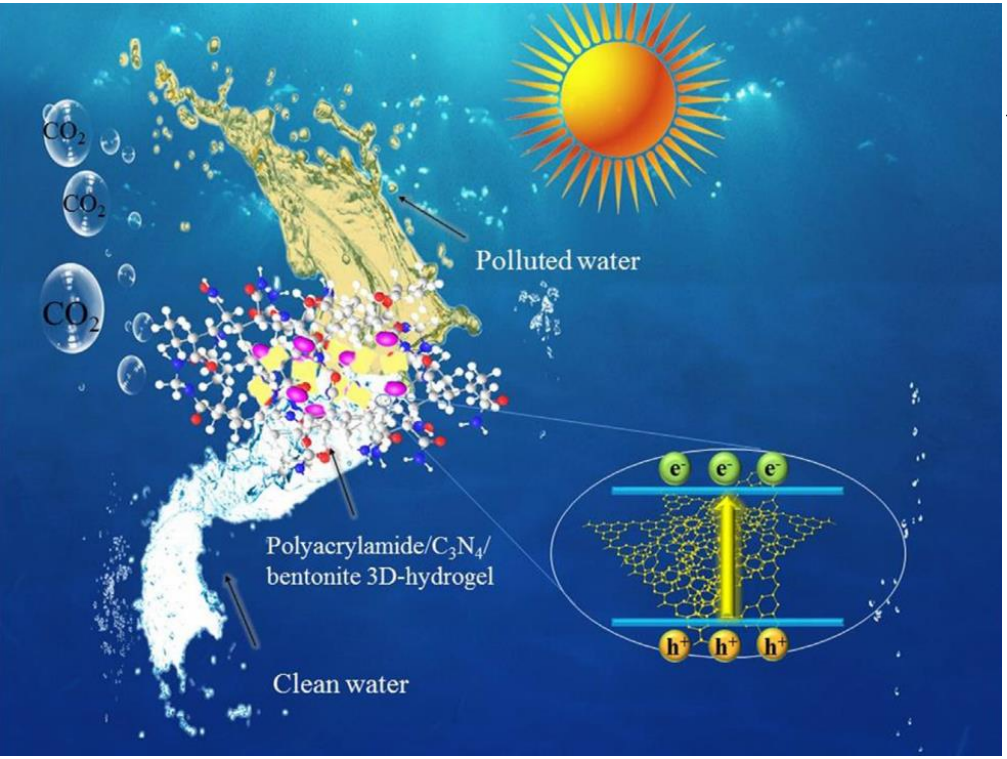


易回收凝胶材料用于高效低价的水处理

Derek Hao

Centre for Catalysis and Clean Energy

15.09.2021

CONTENT

ABOUT ME

Derek Hao

Research fellow at Centre for Catalysis and Clean Energy, Griffith University

Education

China University of Geosciences Beijing (CUGB) **2013-2017**
Bachelor of engineering in Materials Chemistry

Tsinghua University (THU) **2014-2018**
Visiting student

University of Technology Sydney (UTS) **2018-2021**
Ph.D. in Environmental Engineering

Research interests

1. Photocatalytic and electrochemical future energy synthesis
2. Photocatalytic oxidation of organic pollutants
3. Synthesis and characterization of functional materials
4. Photocatalysts and electrocatalysts
5. Nanotechnology

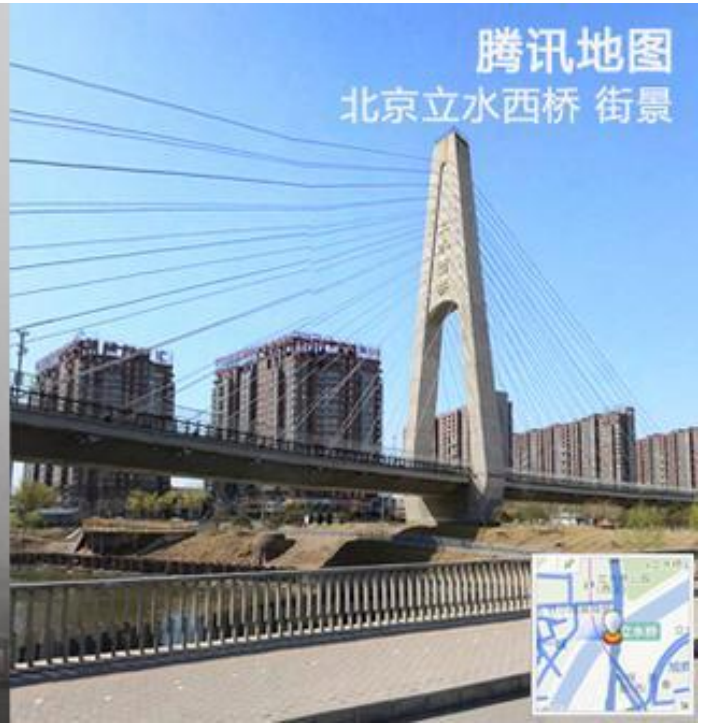
Publications

Publications: 45 First/corresponding author publications: 20
Citations: 1197 H-index: 18
ESI high cited paper (1%): 4 ESI hot paper (1‰): 1

Memberships

- Royal Society of Chemistry
- Australian Nanotechnology Network
- Australian Water Association

研究背景



The increasing consumption of fossil fuels are causing serious energy and environmental problems.

研究背景

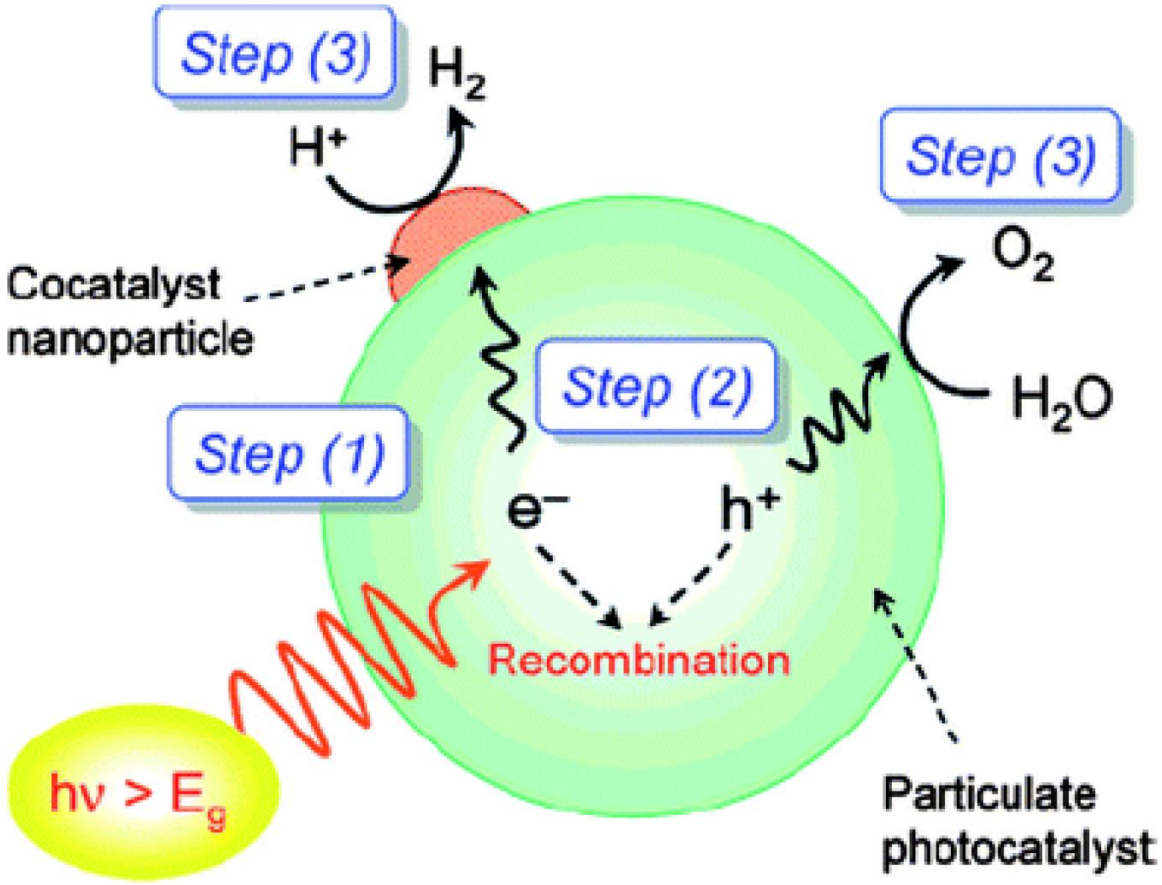
In Australia, the area of great barrier reef is decreasing. In 2019, the bramble cay melomys became extinct.
This is the first kind of became animal extinct because of the climate change.

研究背景

Solar cells

Except solar cell, what else can we do to utilize solar energy?

Photocatalysis



What is photocatalysis?

Photocatalysis is the acceleration of a photoreaction carried by the photogenerated electron-hole pairs and the secondary reactions.

Alshammari A, et al. Semiconductor Photocatalysis: Materials, Mechanisms and Applications. 2016 Aug 24:302-341.

光催化技术

高效

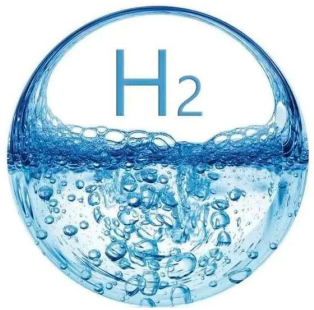
安全

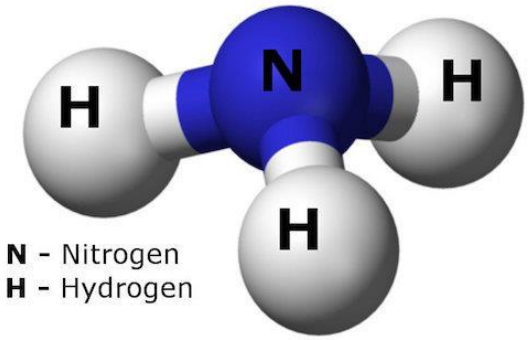
环境友好

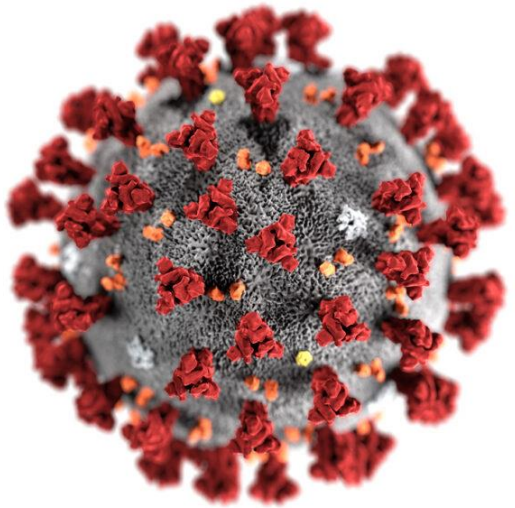
Applications

Photogenerated electrons
1. Photocatalytic H_2 generation
2. Photocatalytic reduction of CO_2
3. Photocatalytic synthesis of NH_3

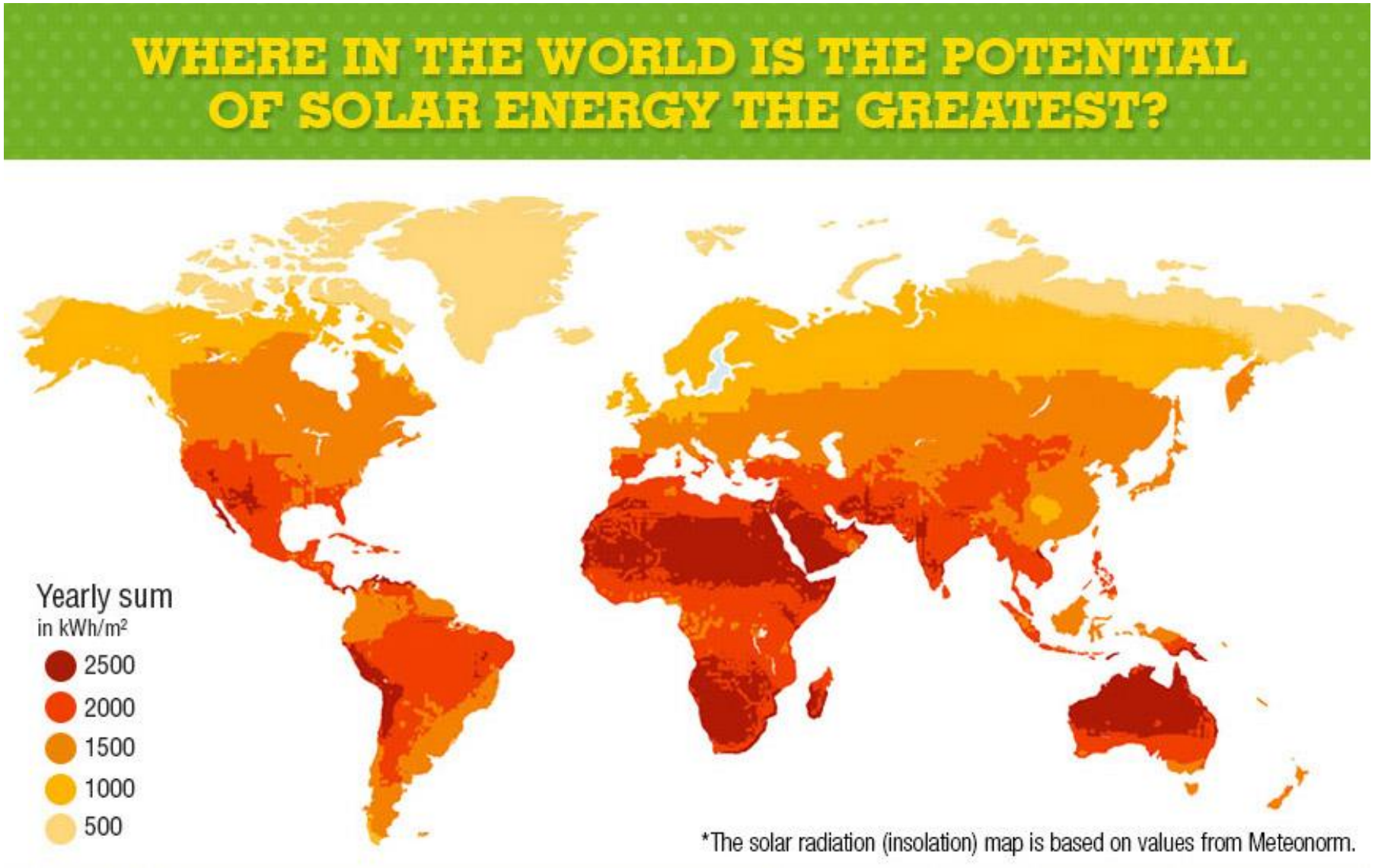
Photogenerated holes
1. Degradation of pollutants
2. Photocatalytic O_2 generation
3. Self-cleaning
4. Antibacterial and antiviral materials



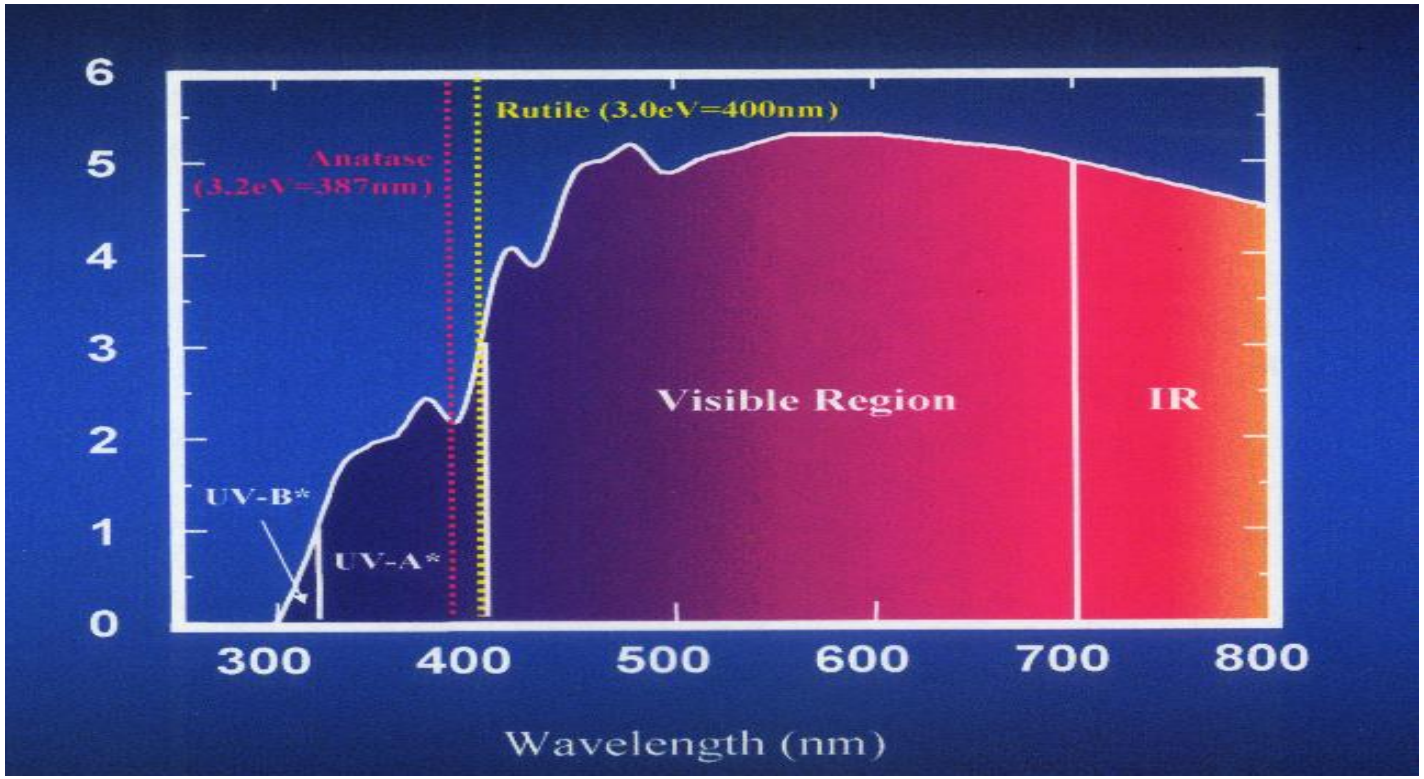




Solar radiation map

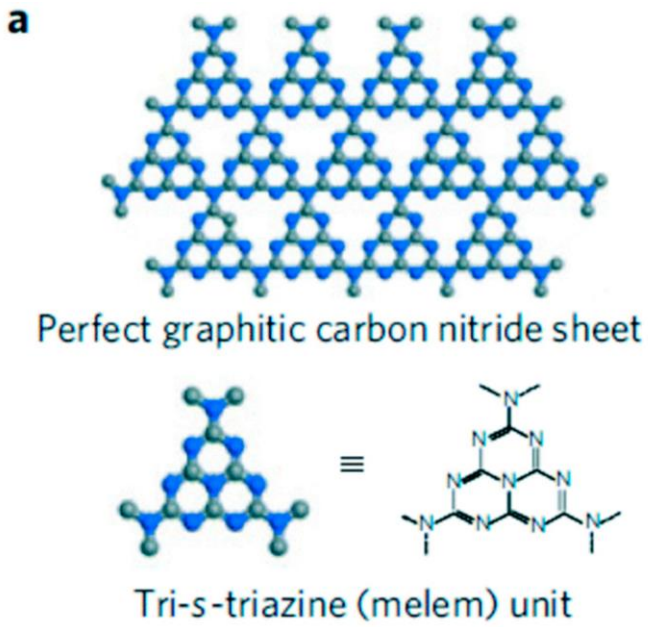


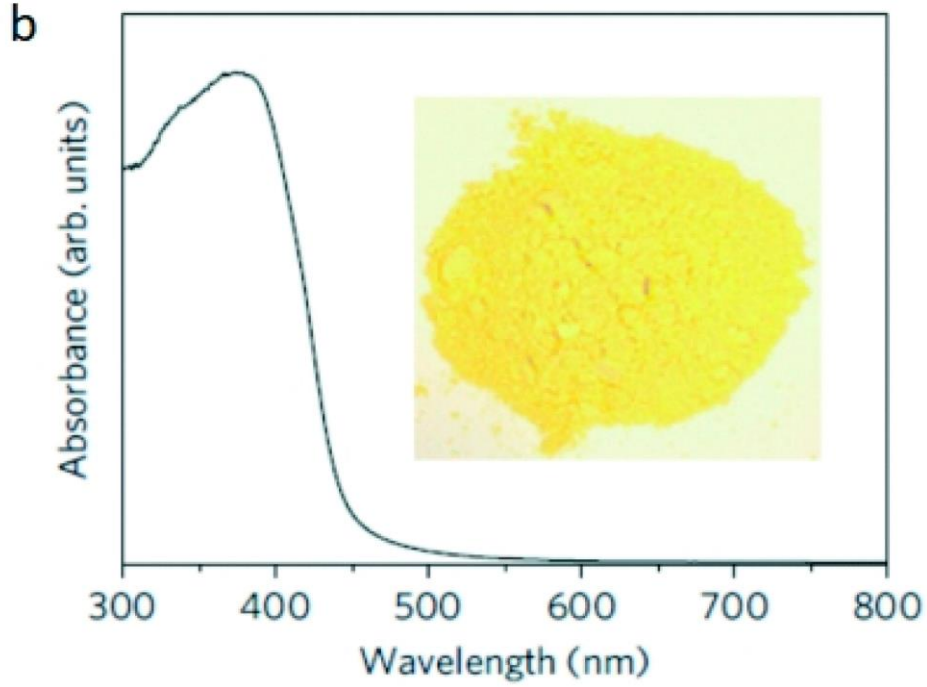
Research gap

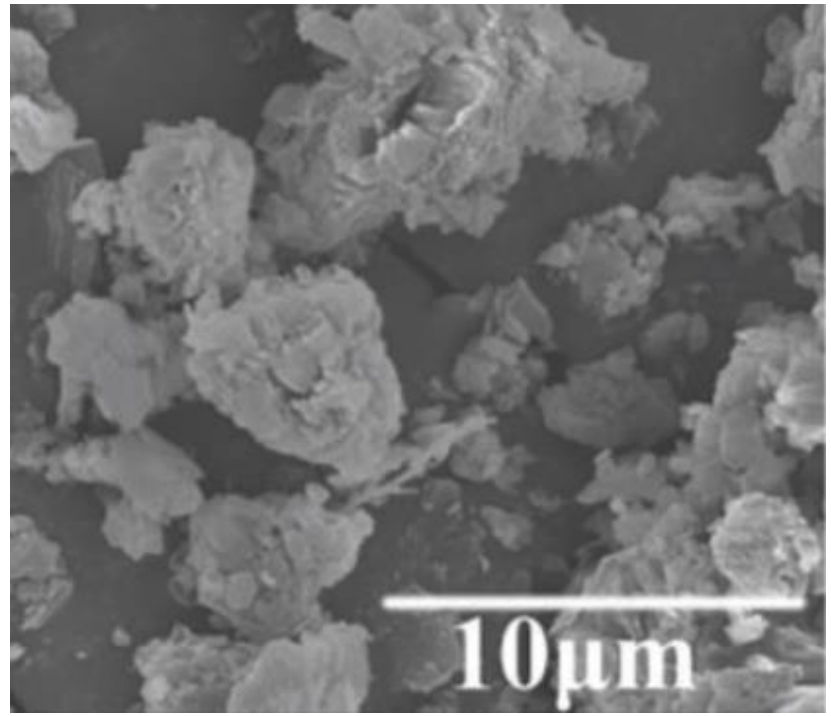


1. Low utilization of solar energy
2. Low quantum efficiency
3. Separation of powder catalyst
4. Stability

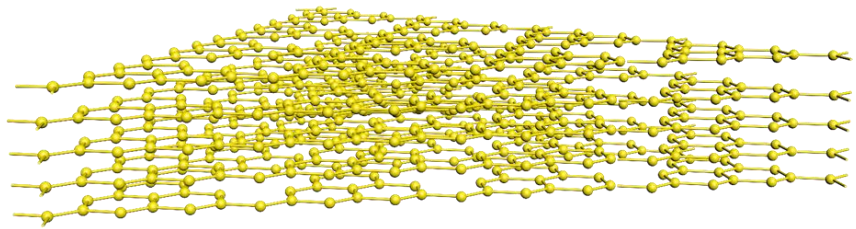
$g\text{-}C_3N_4$





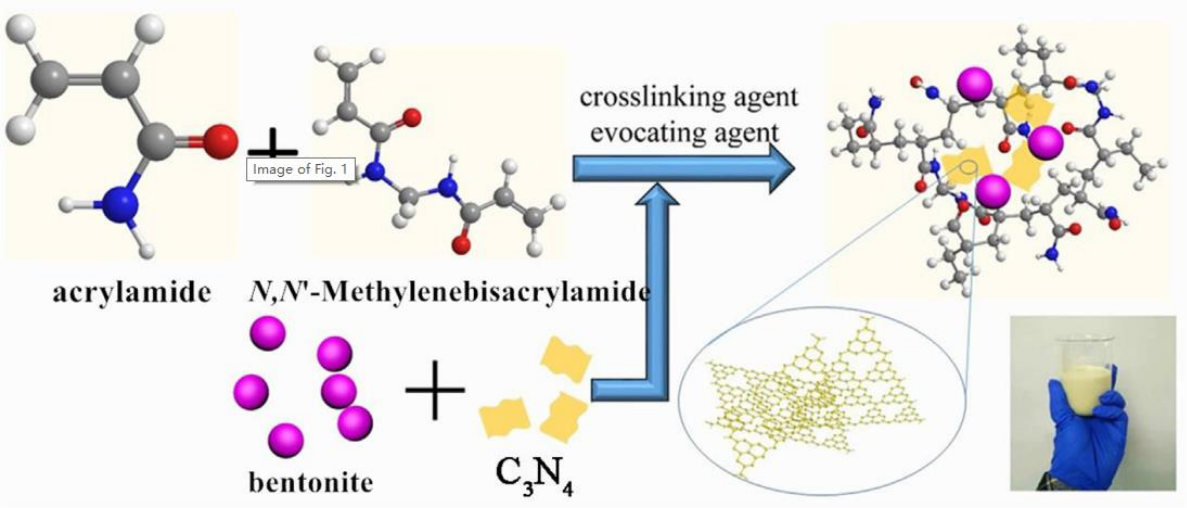


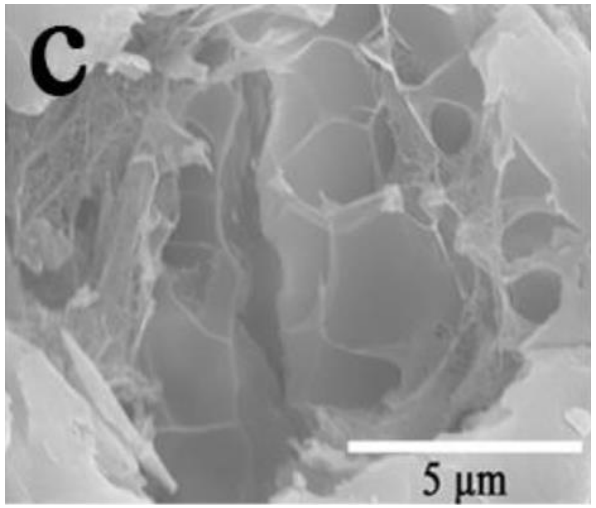
Catalysts 8.2 (2018): 74

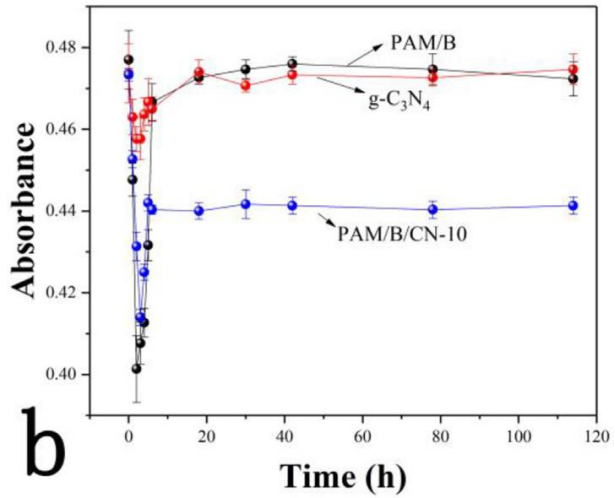


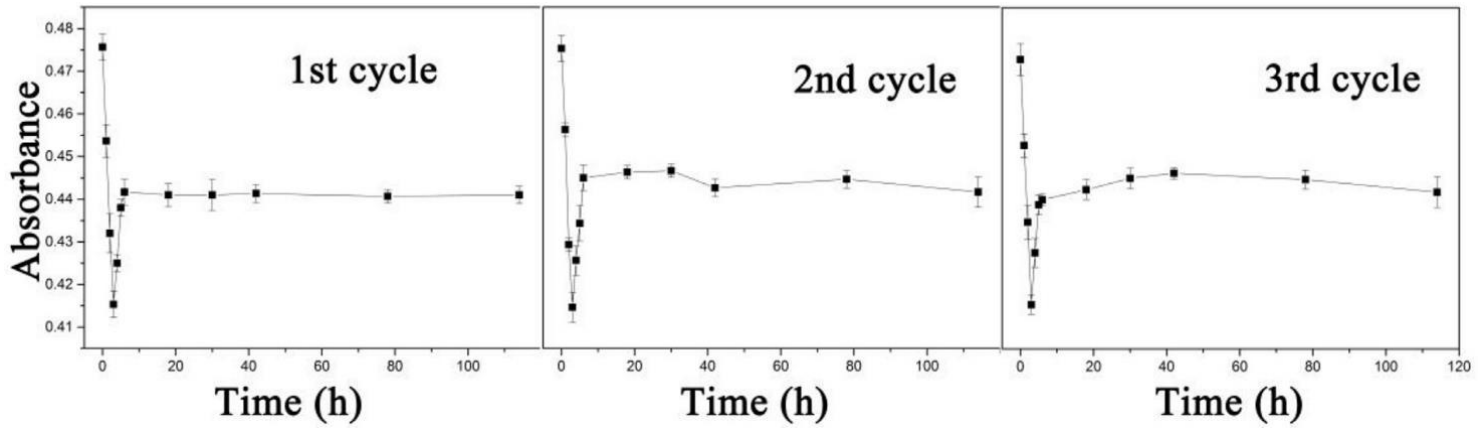
项目介绍

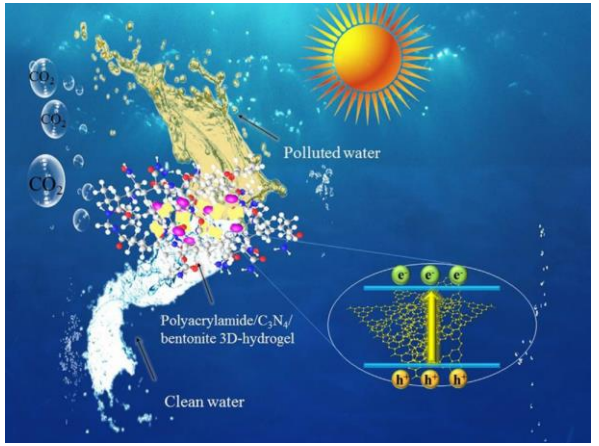
1. 膨润土/g-C_3N_4 水凝胶





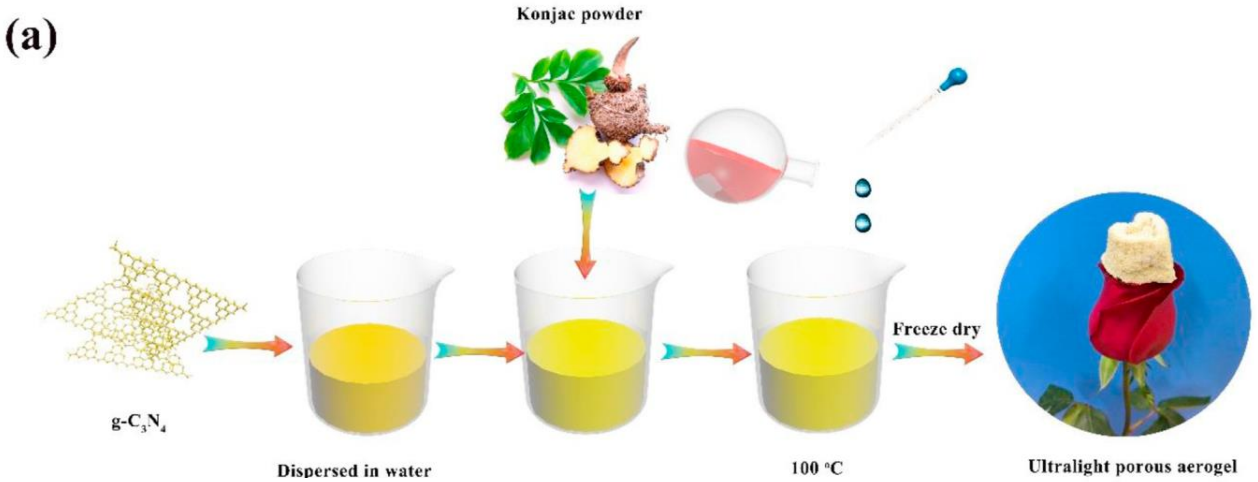


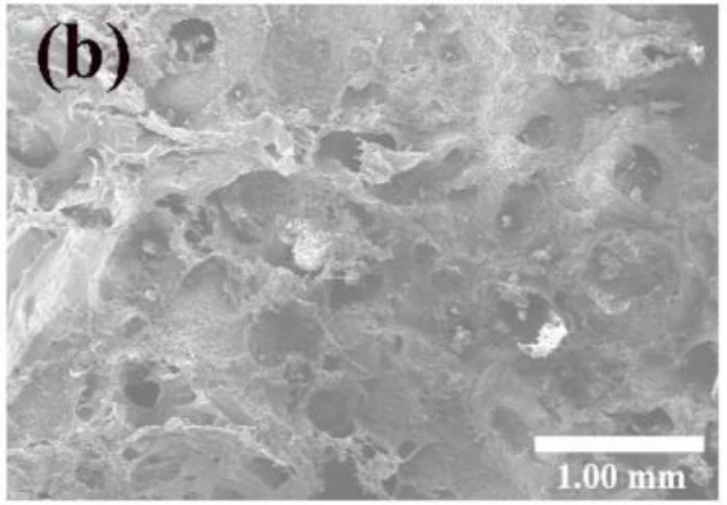


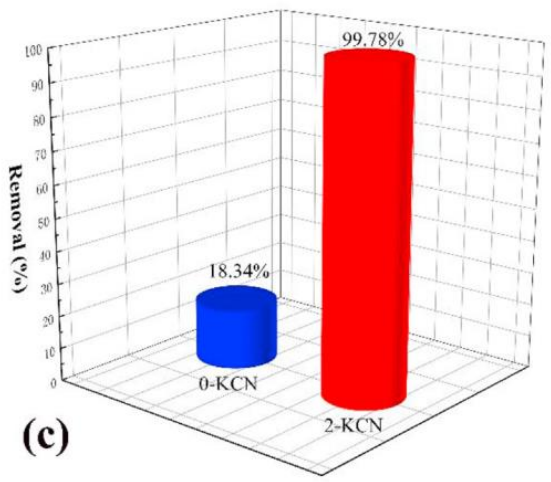


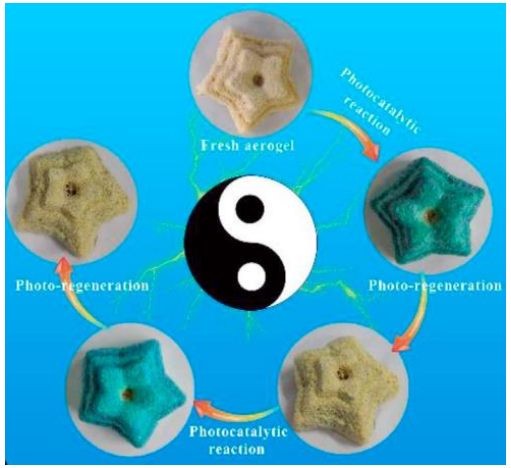
项目介绍

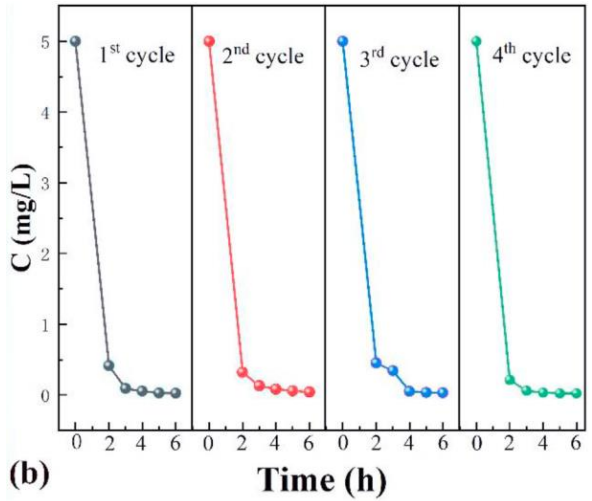
2. 魔芋/g-C_3N_4 水凝胶





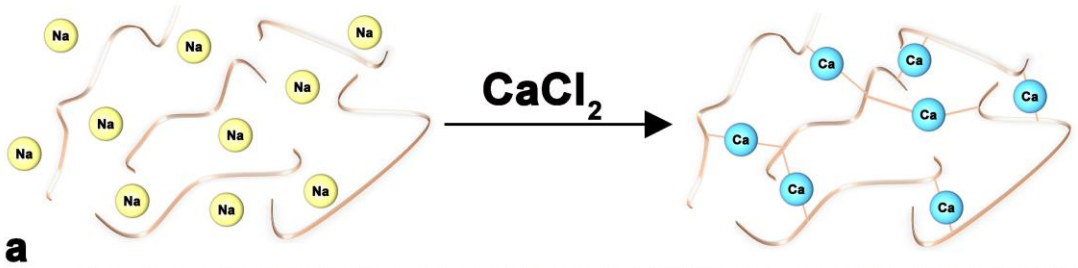


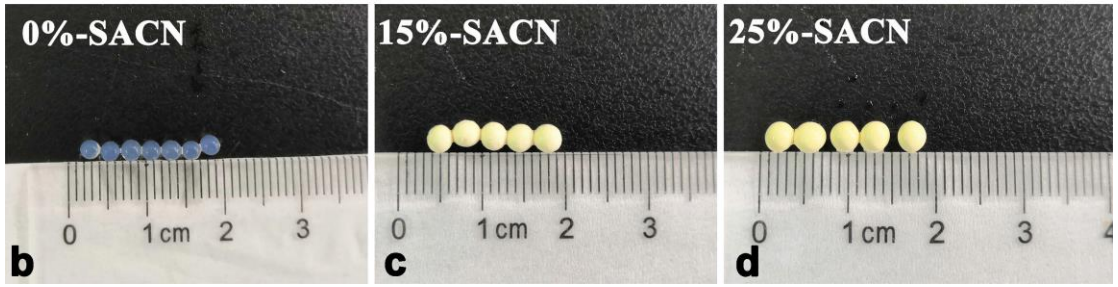


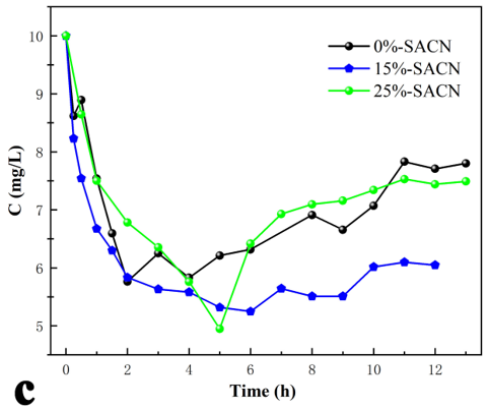


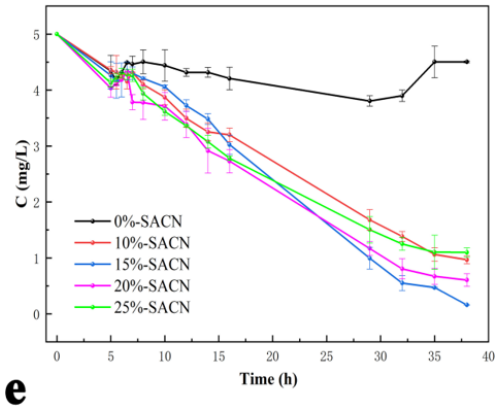
项目介绍

3. 海藻酸钙/g-C_3N_4 水凝胶

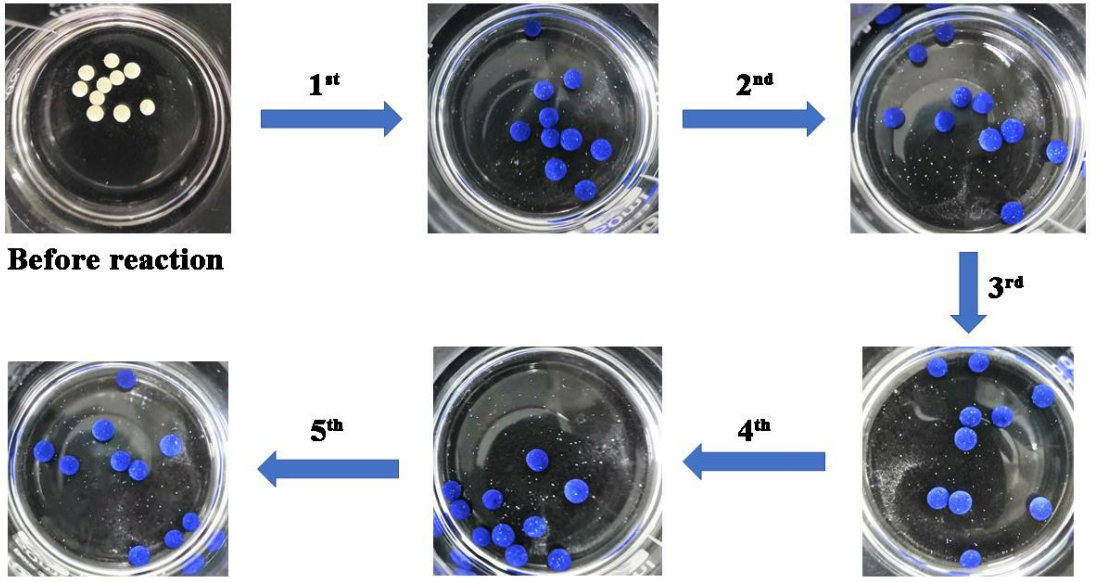


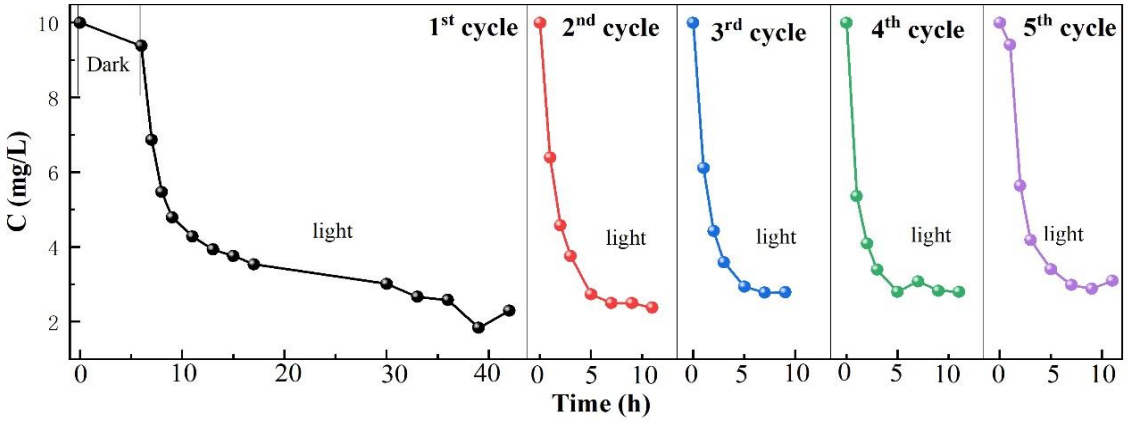






The removal of organic pollutants in both flow and static state were increased.





前景分析

1. 合成简单

2. 成本低廉

3. 催化活性好

4. 易回收利用

5. 应用广泛

Acknowledgment

Australian Government
Australian Research Council

Griffith UNIVERSITY

UTS UNIVERSITY OF TECHNOLOGY SYDNEY

Research collaborators and students

Thank you for the attention