CARBON QUANTUM-DOTS(CQDs)-TITANIUM NANOTUBES(TNTs) PHOTOCATALYST FOR CO2 CONVERSION TO CH4

Project Leader : Assoc.Prof.Dr. Azrina Binti Abdul Aziz
Researchers : NurNisa Aqilah Binti Mohd Rapidi &Ummi AqilaSuhaimi
Faculty : Faculty of Civil Engineering Technology
Telephone : <+600193361509
Email : <azrinaaziz@ump.edu.my >

Universiti Malaysia PAHANG
Engineering • Technology • Creativity
www.ump.edu.my

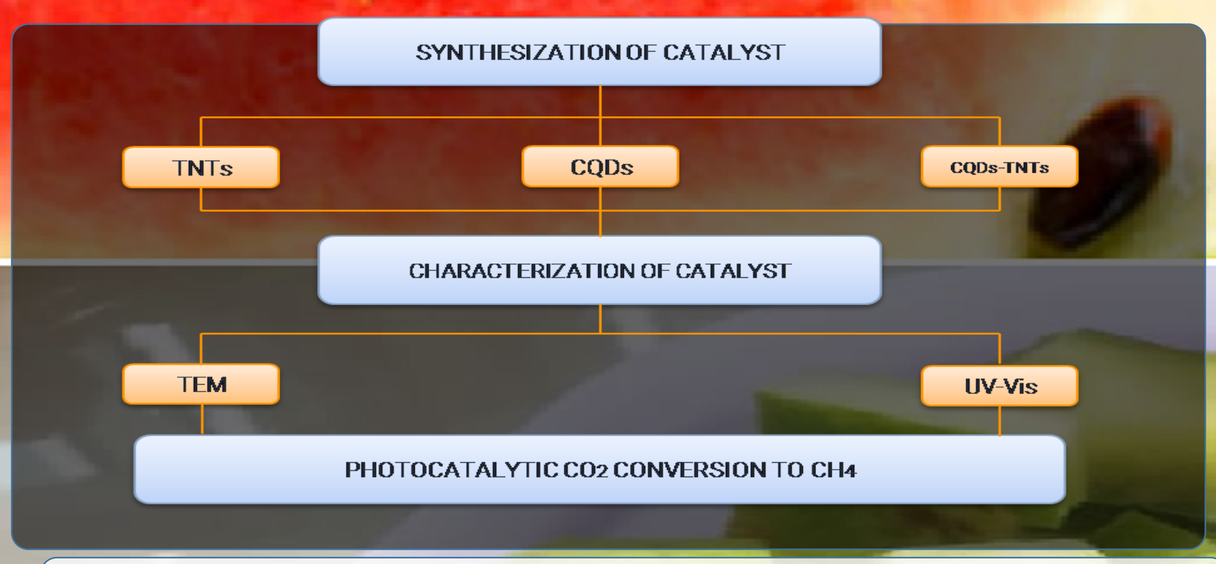
INTRODUCTION

The abundance of carbon dioxide as greenhouse gas makes it potentially useful for chemical syntheses in order to recycling it into useful chemicals will become a more attractive alternative for industry. This study focuses on synthesize and characterize TNTs and CQDs via hydrothermal method. One of the common methods to achieve activation is via sample acts as photocatalyst to improve the conversion of carbon dioxide to methane through photocatalysis. TNTs is synthesis using a hydrothermal method meanwhile, for CQDs extracted from Watermelon Rinds is synthesis by facile hydrothermal m. Titanium dioxide nanoparticles are photocatalysts, which have the capability to use energy in light to catalyse reactions with other molecules at reduced temperatures. cylinders. As TNTs and CQDs were successfully synthesized and characterized by Transmission Electron Microscopy (TEM). The image results indicate that TNTs structure has an average diameter of 10.55 nm and form into thick particles of nanotube. Meanwhile image of CQDs shows the morphology of CQDs is approximately spherical and the average particle size is 48.68 nm.

OBJECTIVE

i. To characterize obtain physical and optical characterization of synthesized photocatalyst.
ii. To synthesis TNTs, CQDs and CQDs-TNTs.
iii. To study the efficiency of CQDs-TNTs and TNTs for photoconversion of carbon dioxide to methane.

METHODOLOGY



POTENTIAL MARKET

-Energy and environment

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Green Tech MALAYSIA
NANO MALAYSIA

BENEFITS

Novel nanocomposite photocatalyst produced

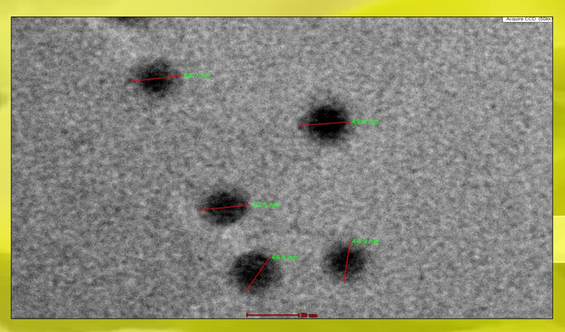
i. CQDs-TNTs has smaller band gap energy than TNTs which can enhance the band gap energy.
ii. Stable under different temperature and pressure
iii. Cost effective----product can be recycled twice
iv. Easy to produce, lightweight.

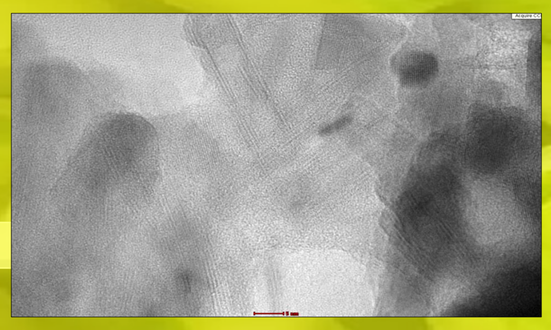
Obtained CH4 from CO2 conversion

i. Proved by CH4 production of CQDs-TNTs is higher with CQDs-TNTs as photocatalyst compare to TNTs.
ii. Used as a fuel for ovens, homes and for vehicles.
iii. Can used for electricity generation.

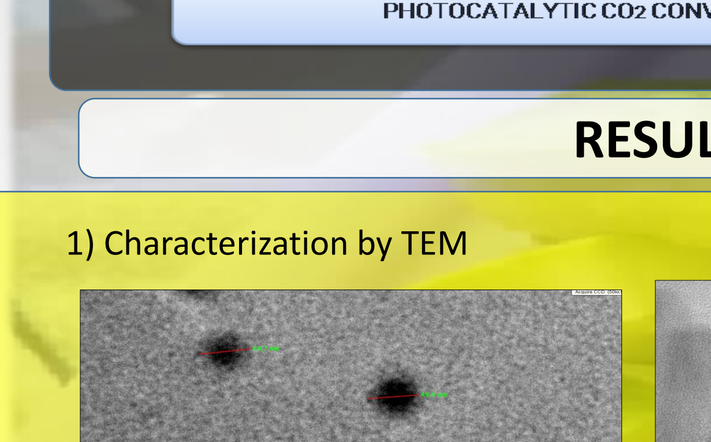
RESULTS

1) Characterization by TEM

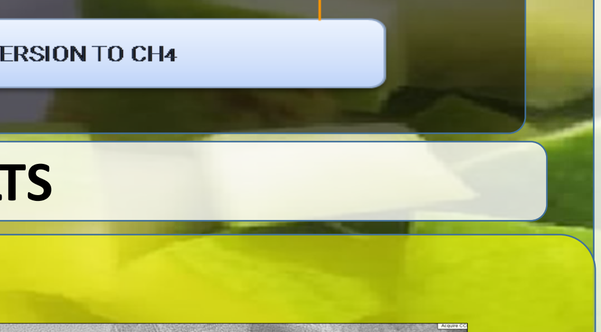


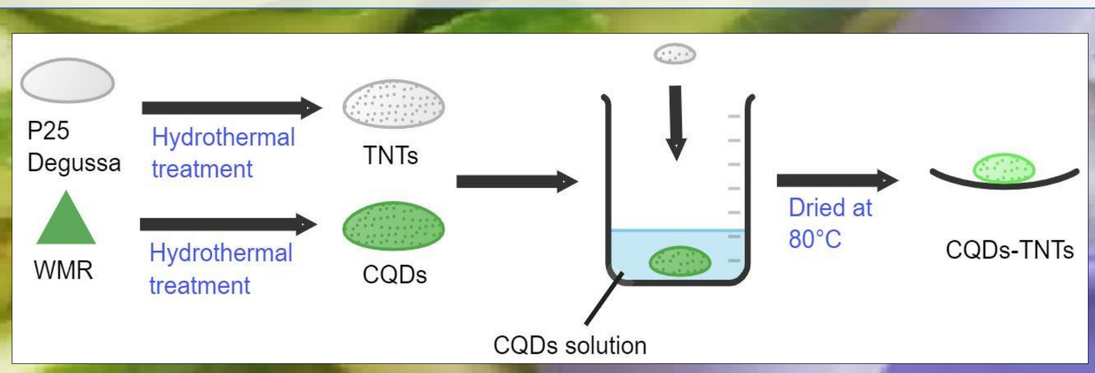


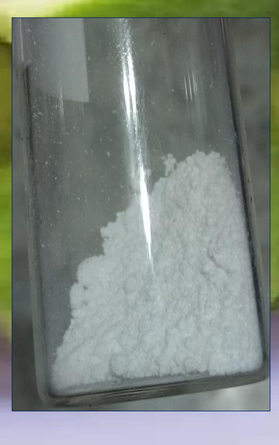
2) Characterize by UvVis



3) Amount of CH4 production over time







Ummi Aqila Binti Suhaimi
0176936559
ummiaqila9694@gmail.com

Nurnisa Aqilah Binti Mohd Rapidi
0196248032
Nurnisa_aqilah@yahoomail.com

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