

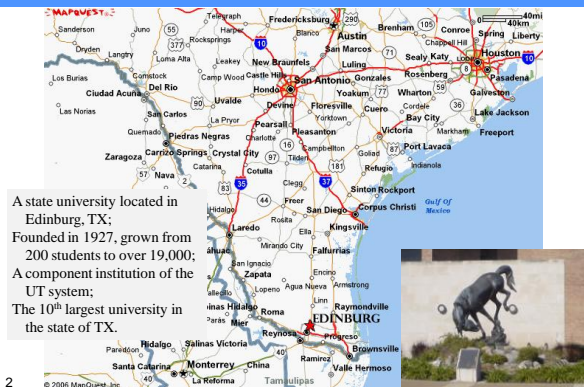
Photocatalytic Decomposition of Dyes by $TiO_2@C$ Nanocomposite

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University of Texas – Pan American



A state university located in Edinburg, TX; Founded in 1927, grown from 200 students to over 19,000; A component institution of the UT system; The 10th largest university in the state of TX.

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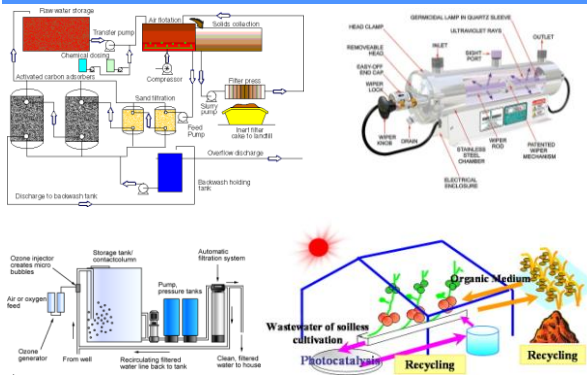
Water Resources

- The health and welfare of people, especially of vulnerable groups such as children, the elderly and poor, are closely connected to the availability of adequate, safe and affordable water supplies.
- Water quality in a wide variety of industrial, municipal and agricultural sources has been seriously tainted due to increasing pollution of ground and surface water from these sources, severely reducing the supply of freshwater for human use.
- There are about 1 billion people in the world whom have no access to potable water and a further 2.6 billion people lack access to adequate sanitation.

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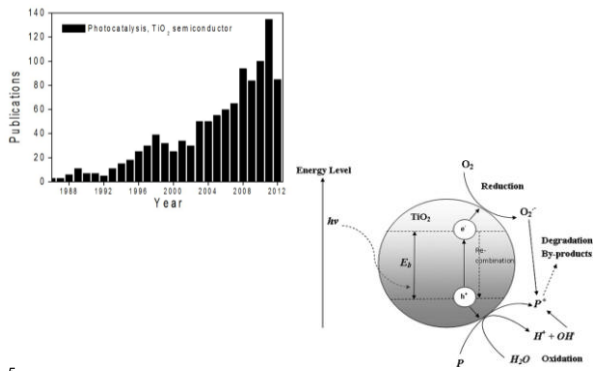
Theron, et al. Crit. Rev. Microbio. 2008; Li, et al. Water Research 2008

Water Treatment Techniques



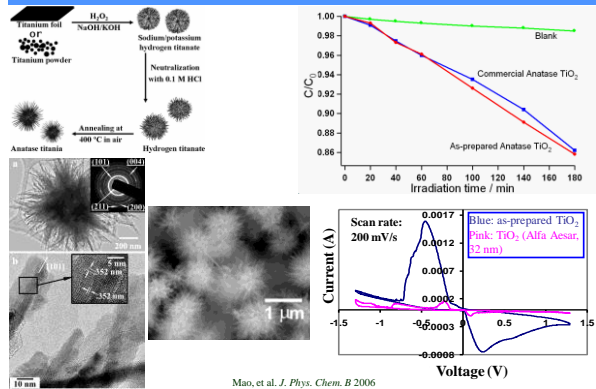
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Photocatalytic Degradation

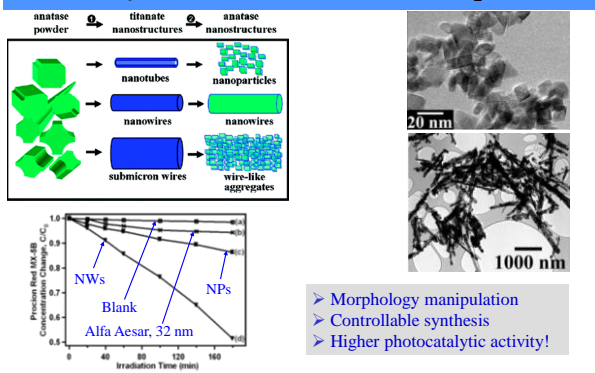


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Photocatalytic Performance of Nano TiO_2



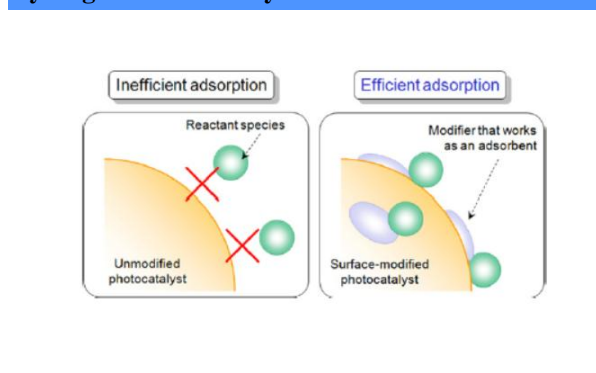
Photocatalytic Performance of Nano TiO_2



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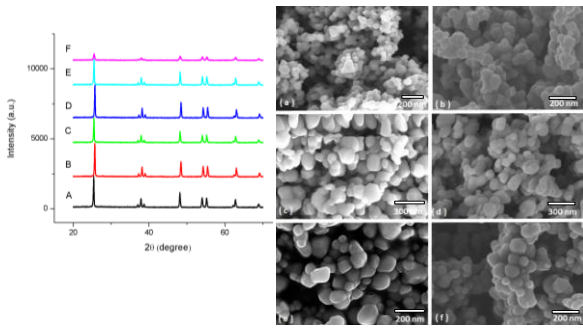
Y. Mao, et al. *J. Am. Chem. Soc.* 2006

Synergetic Photocatalyst and Adsorbent



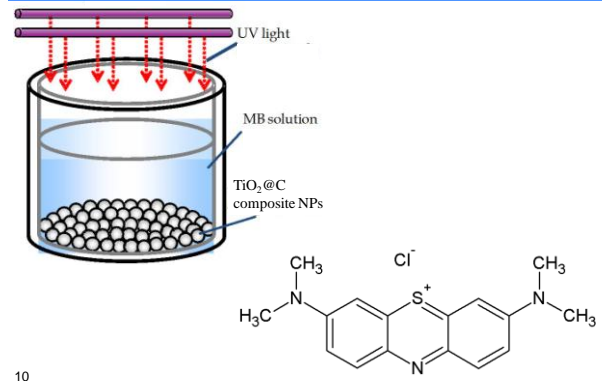
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TiO₂@C Composite



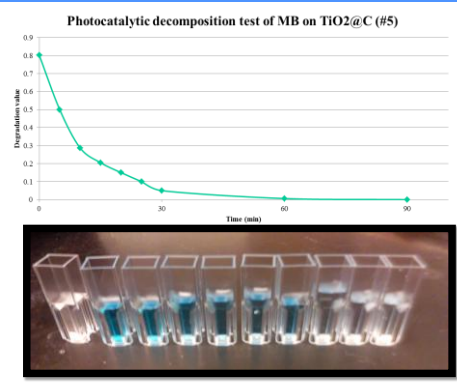
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Photocatalytic Test of TiO₂@C Composite



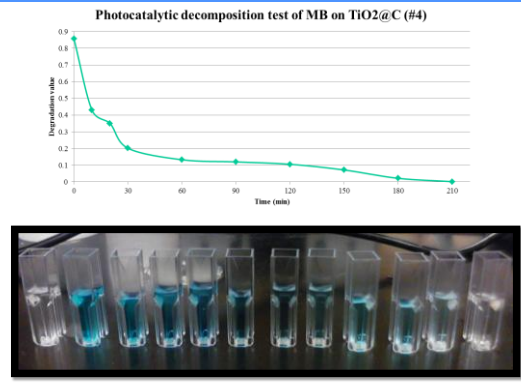
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Photocatalytic Decomposition Activities



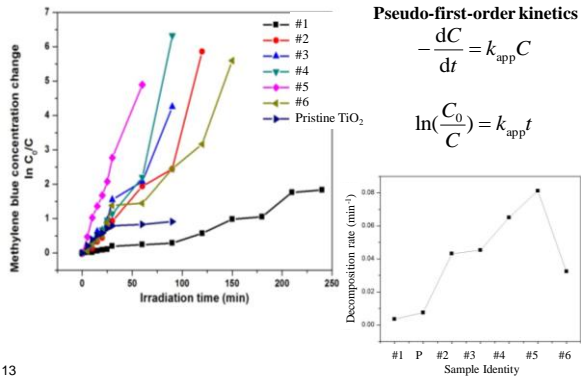
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Photocatalytic Decomposition Activities



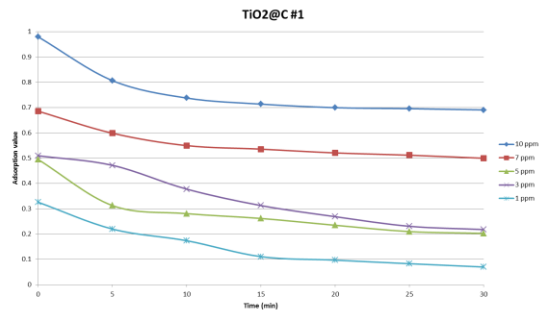
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Photocatalytic Decomposition Kinetics



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Adsorption Kinetic Studies



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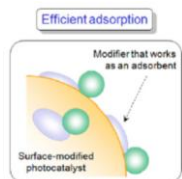
Summary

A facile coating procedure has been developed to modify the surface of commercial TiO_2 particles.

These TiO_2 @C composites show faster photocatalytic degradation performance based on kinetic studies.

Adsorption isotherms, kinetics, and thermodynamic studies are under investigation.

These novel composites are expected to possess potential applications.



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Acknowledgements

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Dr. Jinbo Zhao
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Thank you for your attention!



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