RESEARCH CATALOGUE

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DEVELOPMENT OF TiO_2 NANOFIBERS FOR PHOTOCATALYTIC BIOMASS CONVERSION TO HIGH VALUE CHEMICALS

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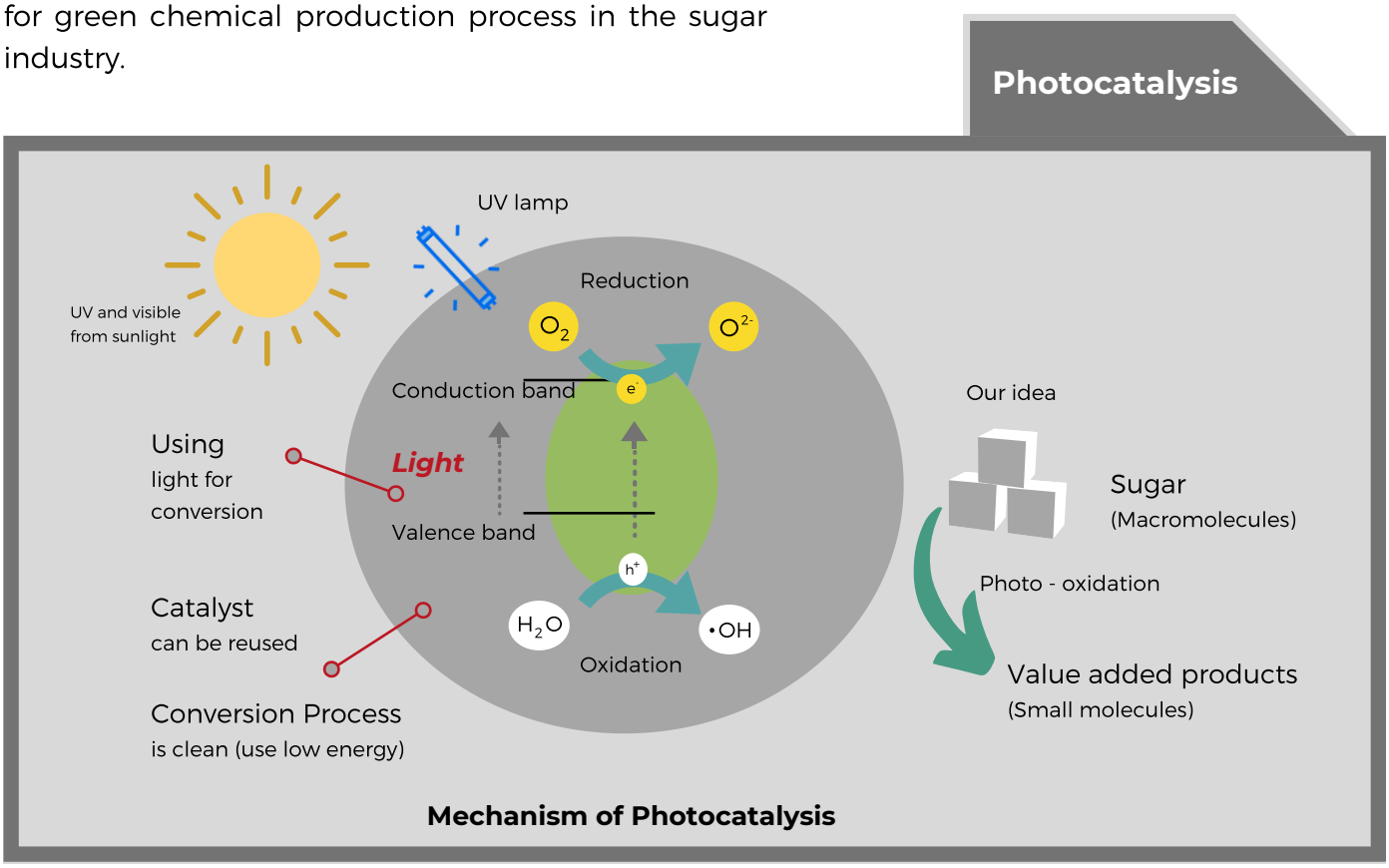
The aim of this research was to develop TiO_2 nanofibers for increasing the efficiency of photocatalytic process to convert glucose into high value chemicals. The high value chemicals found in this work are gluconic acid, arabinose, xylitol, and formic acid. These products can be further used as building blocks or intermediates in various applications. For example, gluconic acid has been widely used in foods, as a polymer precursor, and in the pharmaceutical industry; and xylitol is used in foods as a sugar substitute and as an ingredient in many dental hygiene products.

The highlight of this research work is that TiO_2 nanofibers can be modified with metals and non-metals which present the highest efficiency in both photocatalytic glucose conversion and product selectivity. These results could be further developed for green chemical production process in the sugar industry.



Mechanism of Photocatalysis

For my PhD studies, I received a full scholarship from The Petch Pra Chom Klao PhD Program and a research fund from JGSEE.

I was also awarded as part of a research team attending the PTTGC Open Innovation Challenge 2016: "Smart-Eco Innovation" a royal trophy from HRM Princess Maha Chakri Sirindhorn and a 500,000 THB cash prize.

I also had the opportunity to spend 6 months at the Vienna University of Technology (TU Wien, Austria). The results of my studies led to two international journal publications as well as two publications in international conference proceedings.