

# 可視-近赤外応答型色素増感剤を用いたナノシート色素増感光触媒による水素製造

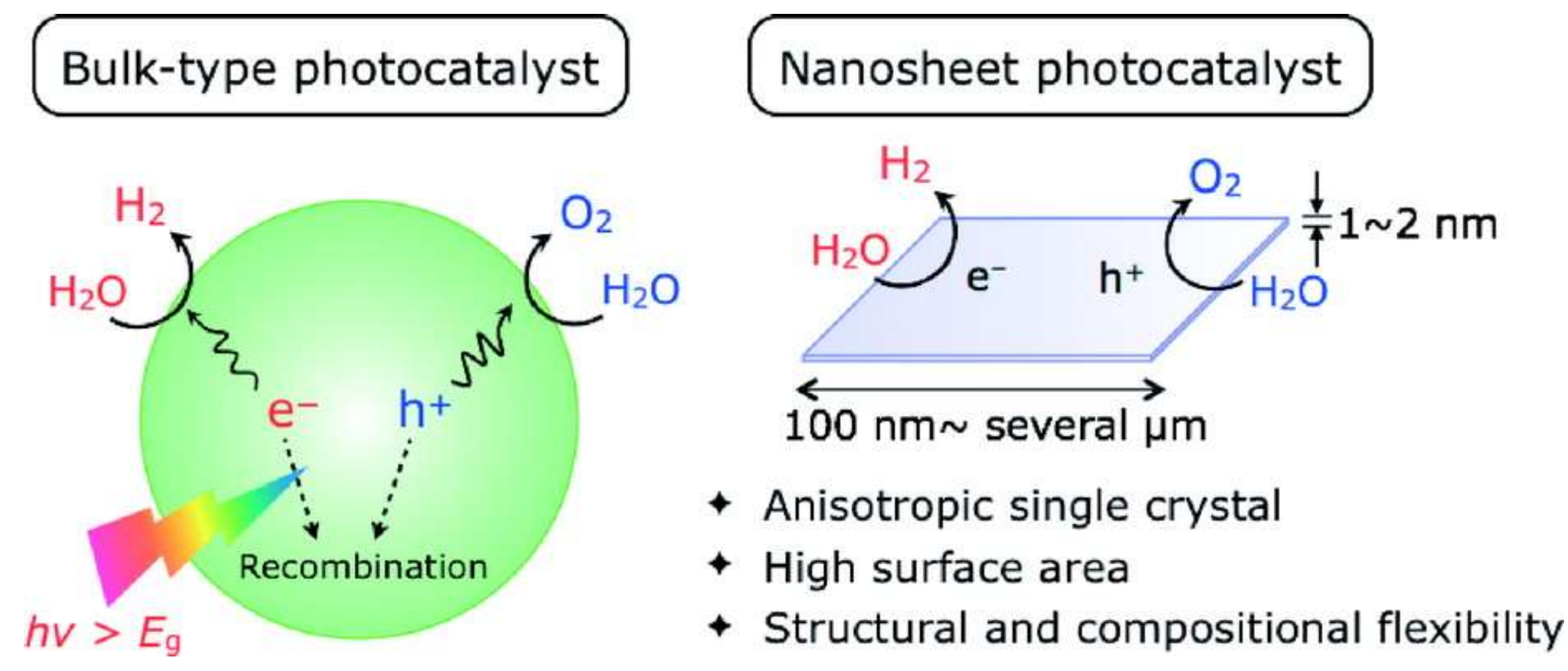
沈 小烽

統合新領域学府・オートモーティブサイエンス専攻

## Highlight of This Work

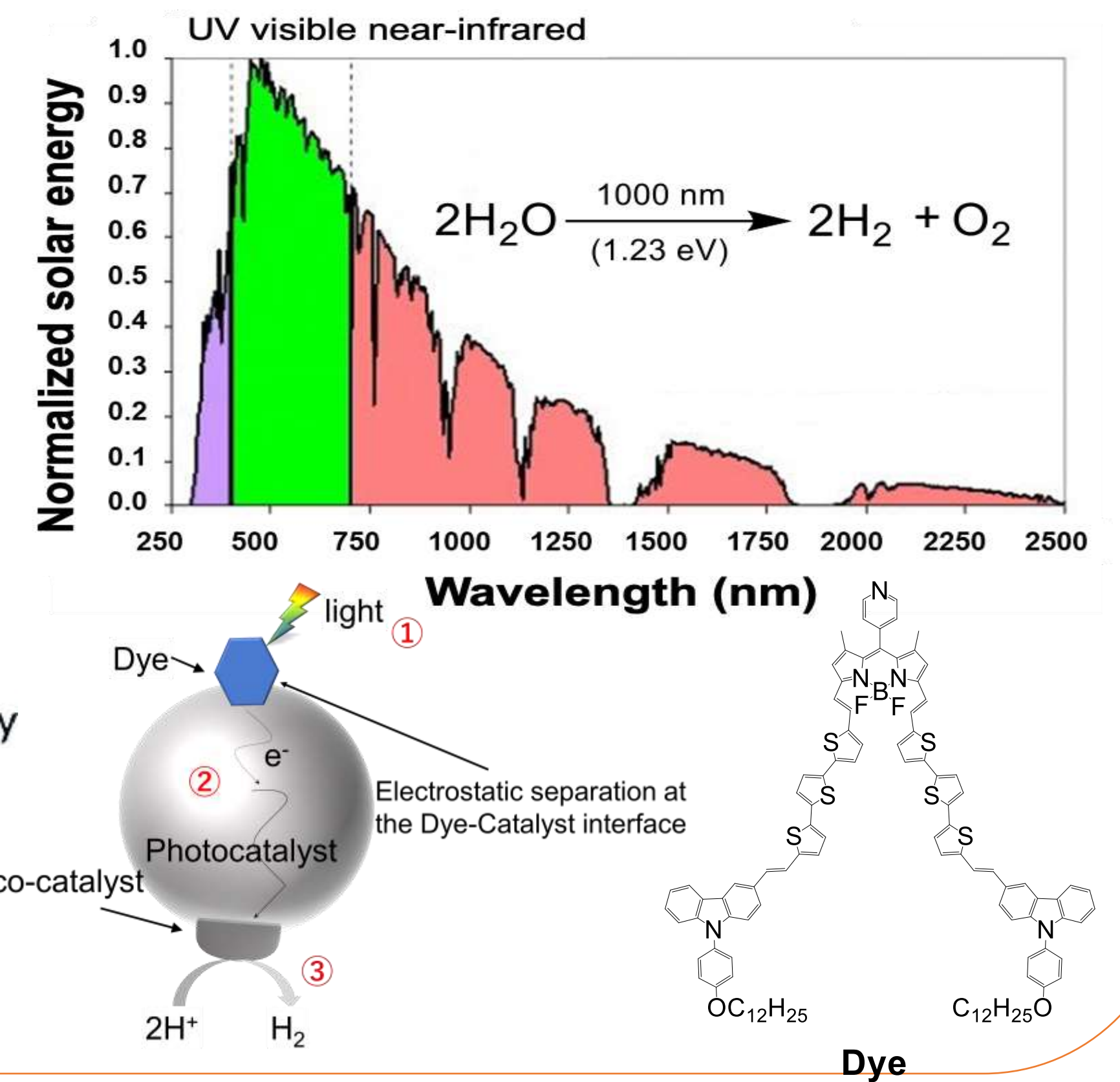
- ◆ Synthesized 2 kinds of nanosheets types TiO<sub>2</sub> (Micro-sheet or flower)
- ◆ Dye/Pt-TiO<sub>2</sub> (Micro-flower) shows good photocatalytic activity at H<sub>2</sub> production test
- ◆ Dye/Pt-TiO<sub>2</sub> showed great hydrogen production activity AQY<sub>900 nm</sub>=1.5 %

## Background

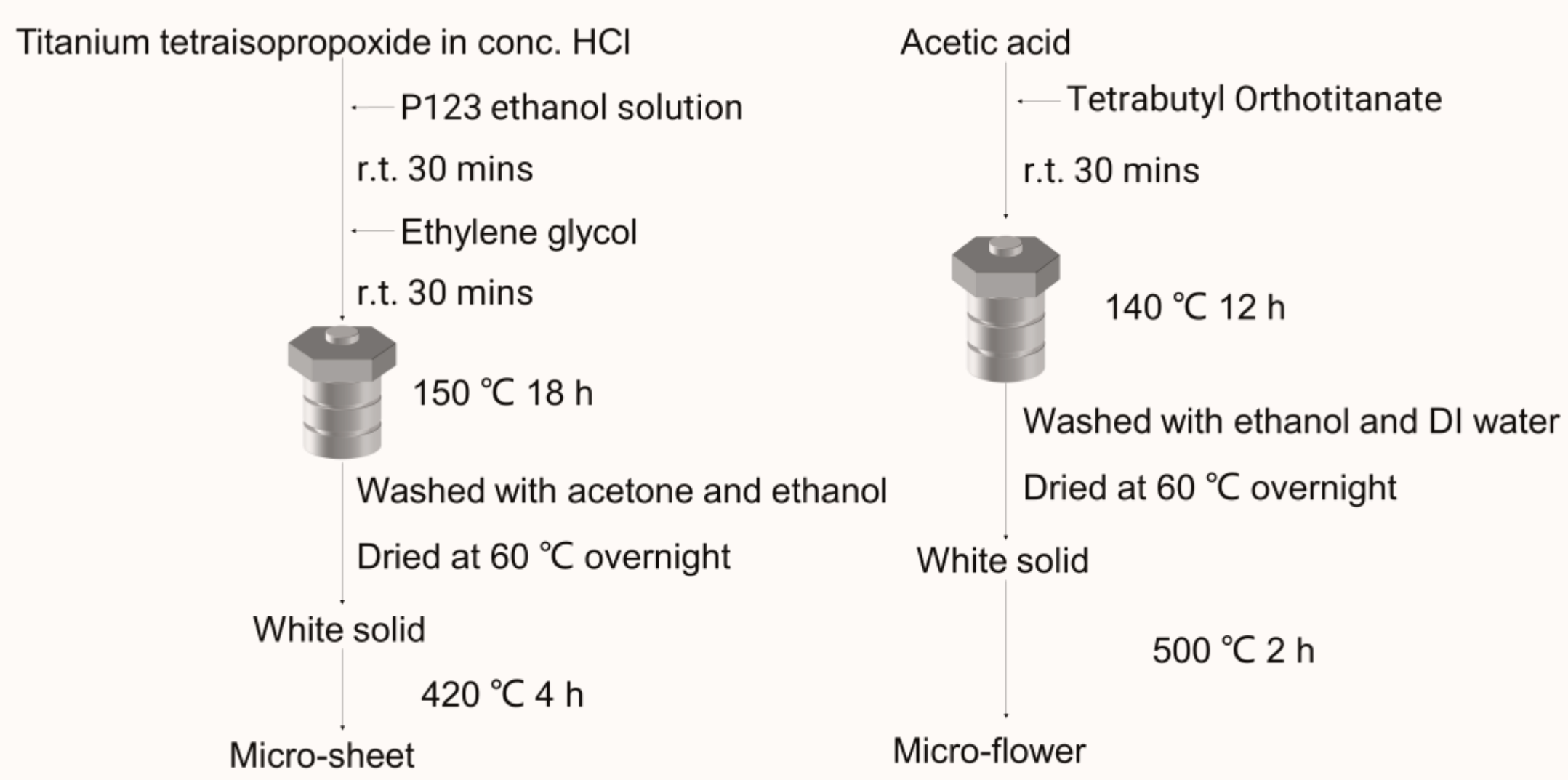


Comparison of bulk-type particles and nanosheets as photocatalysts<sup>[1]</sup>.

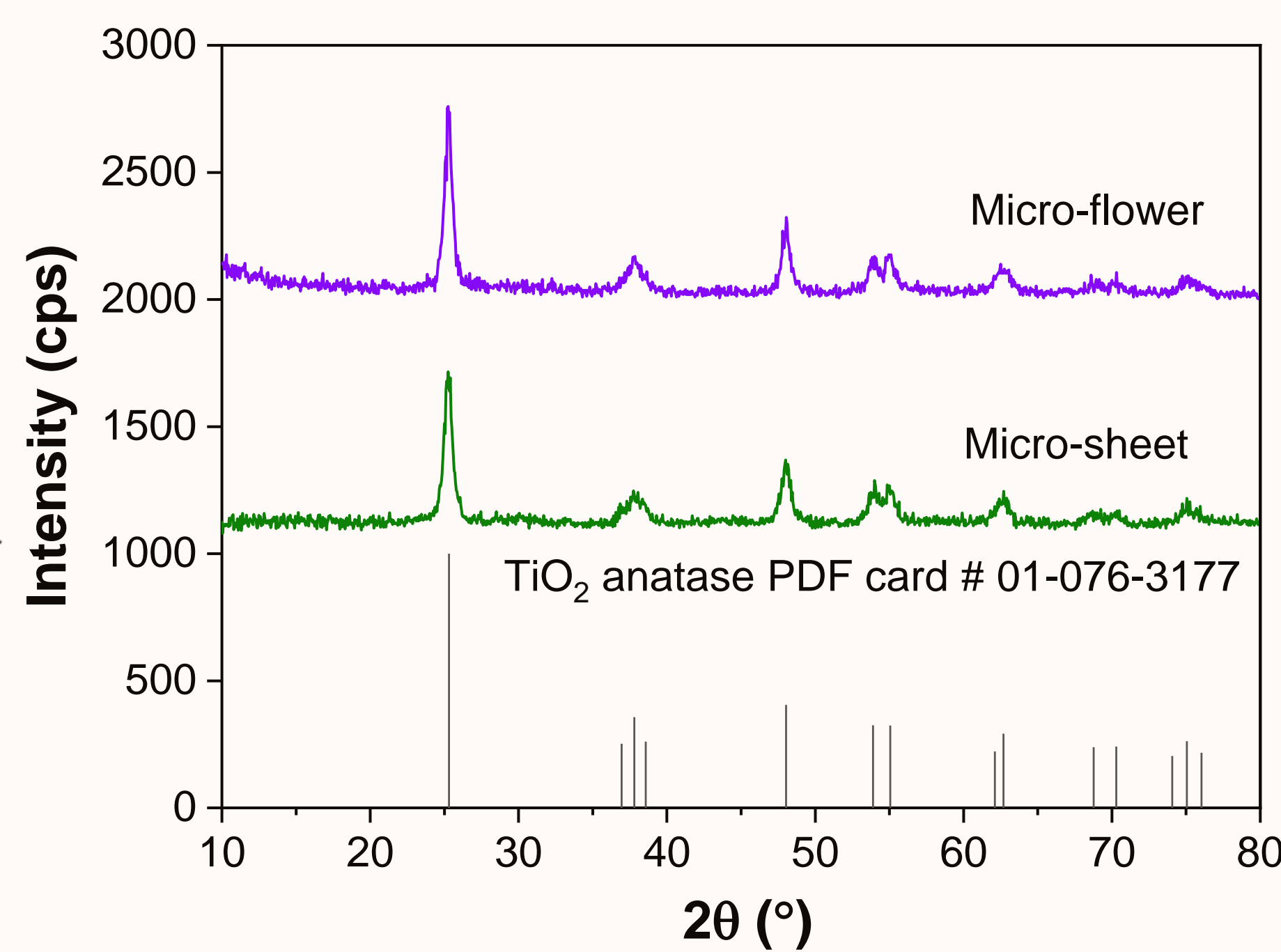
[1] Maeda K., et al., *Bulletin of the Chemical Society of Japan*, 2019, 92, 38-54.



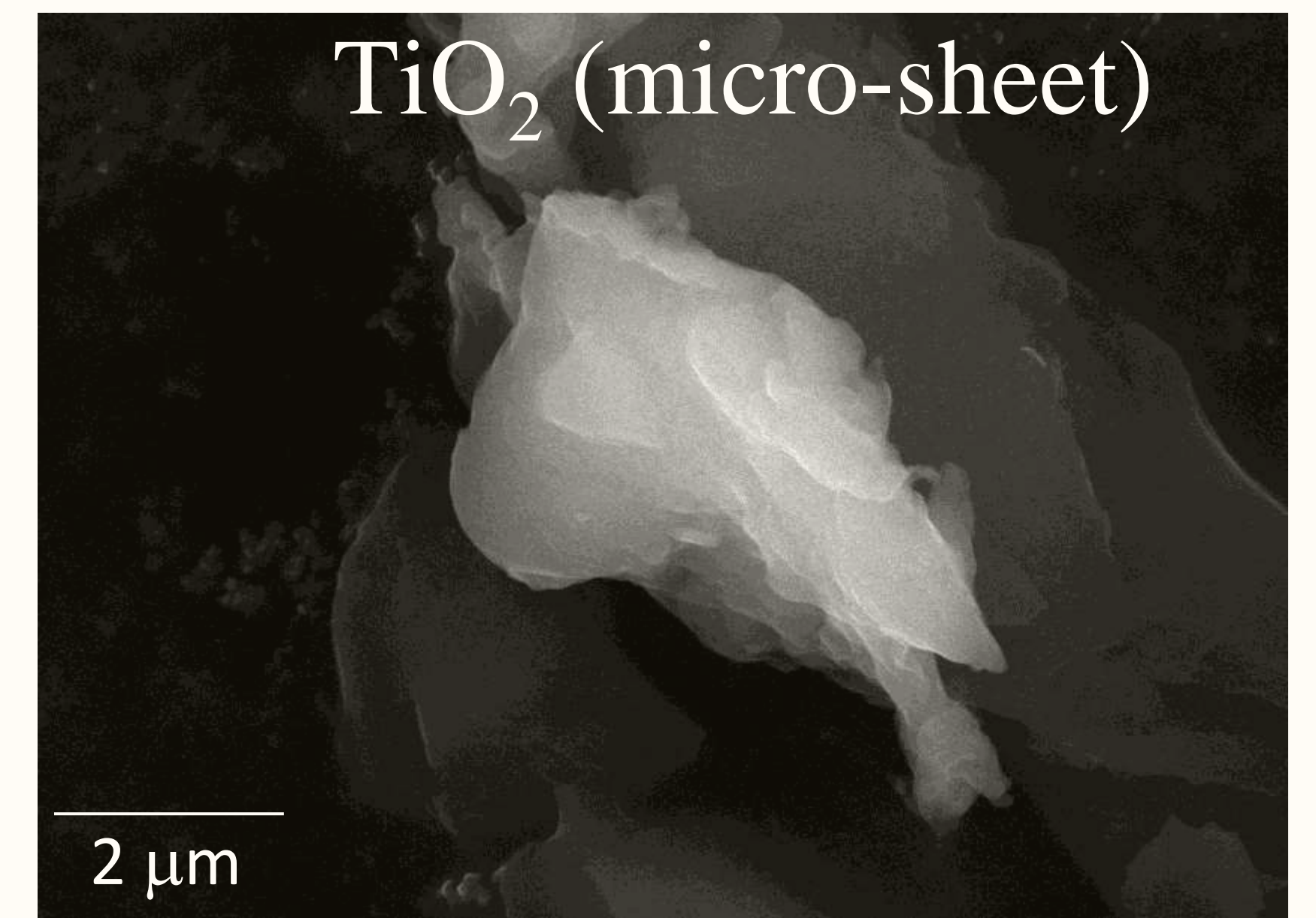
## Preparation of TiO<sub>2</sub>



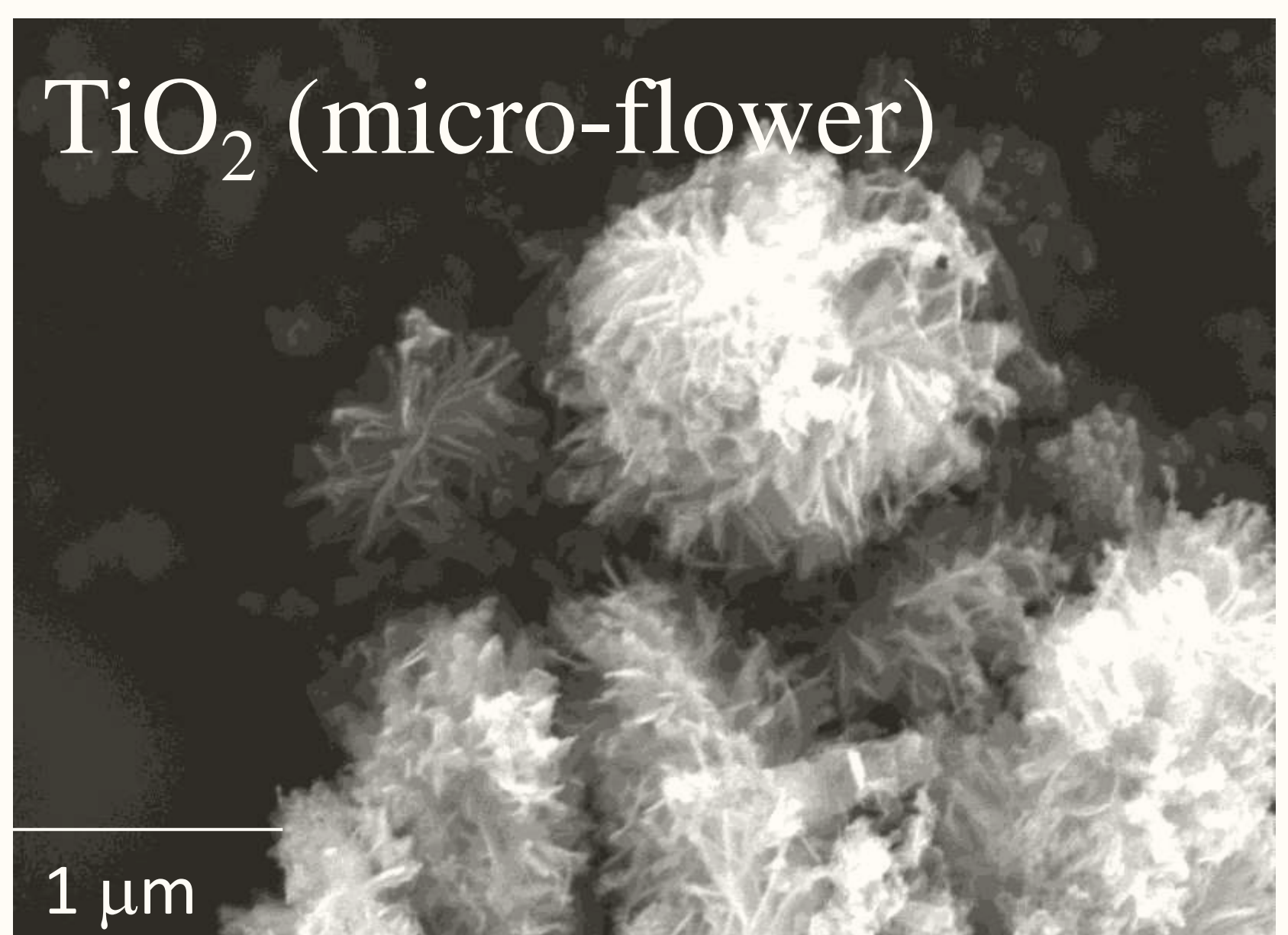
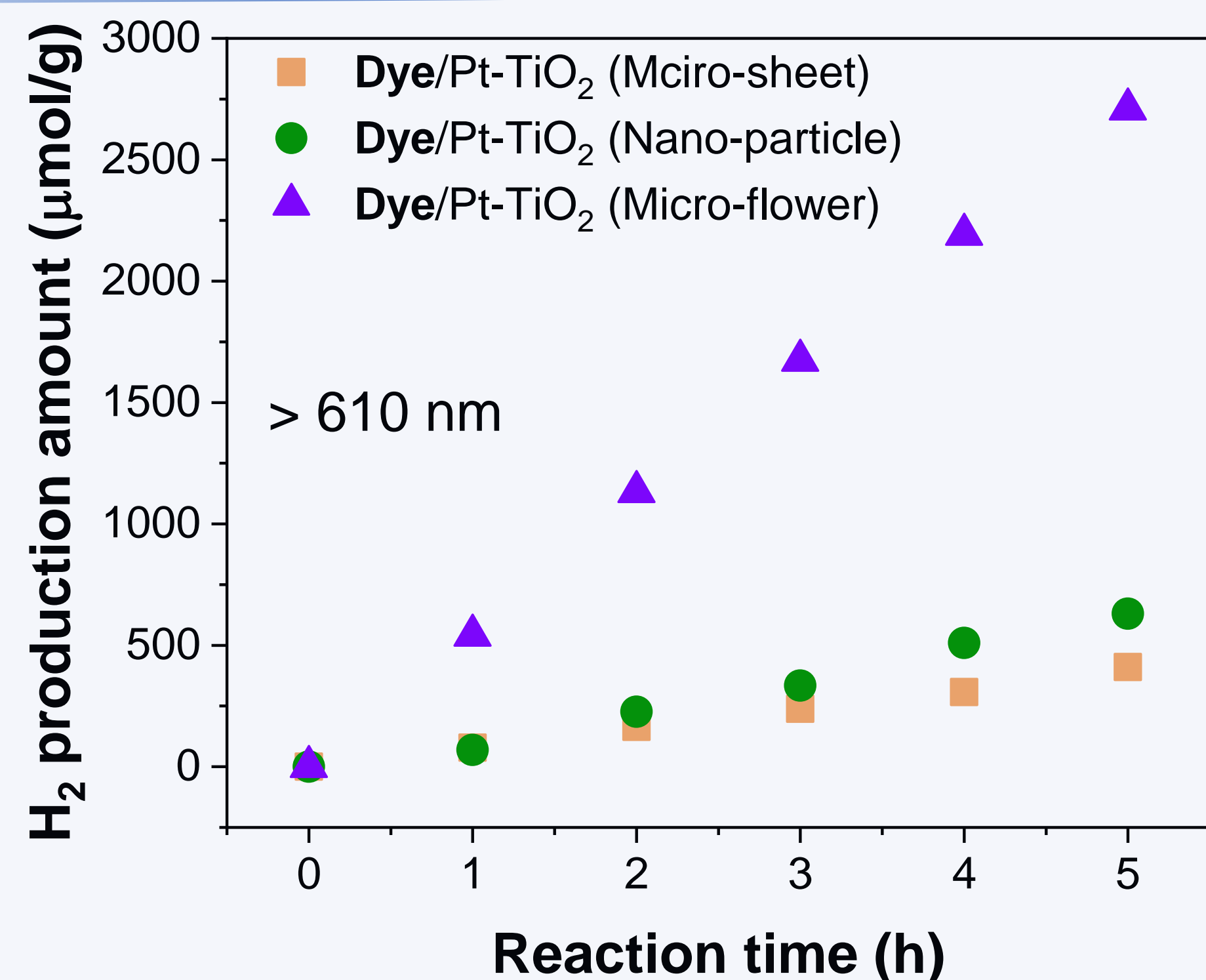
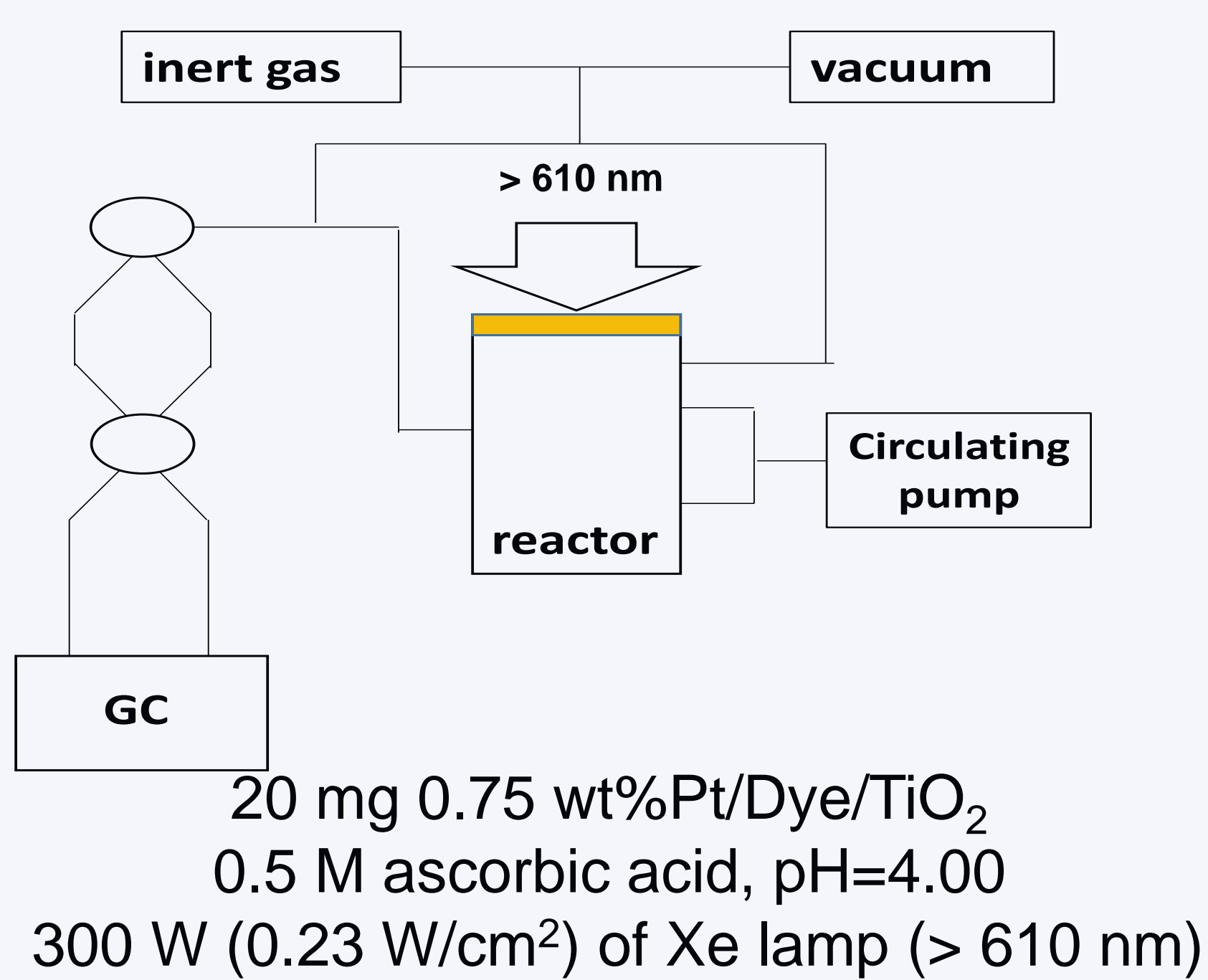
## XRD results of TiO<sub>2</sub>



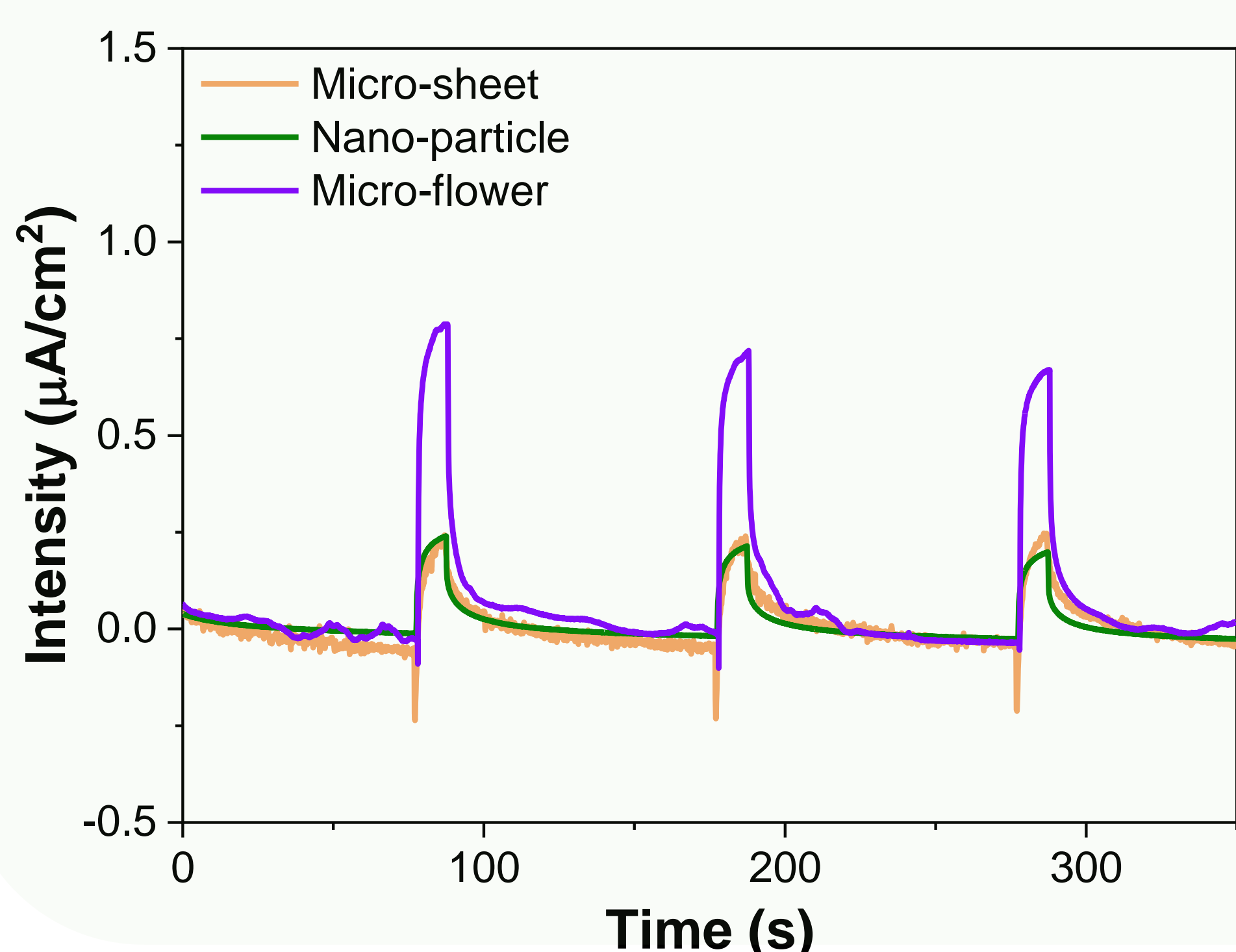
## SEM images of TiO<sub>2</sub>



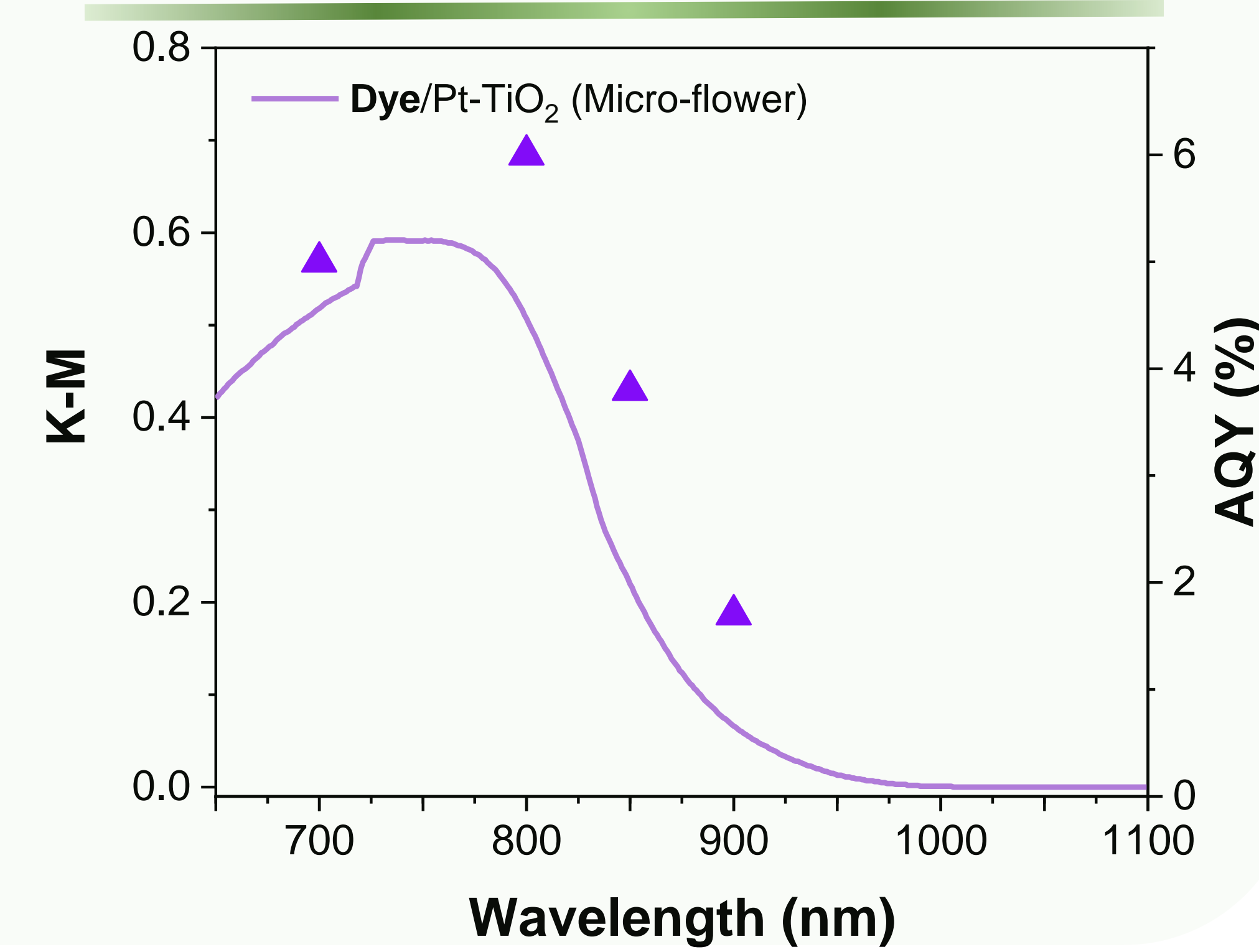
## Photocatalytic H<sub>2</sub> production in water medium



## Photocurrent test



## AQY test



## Summary

- ✓ 2 kinds of nanosheets types TiO<sub>2</sub> were successfully synthesized
- ✓ Dye/Pt-TiO<sub>2</sub> (Micro-flower) can use near-infrared light to produce H<sub>2</sub> from water
- ✓ Dye/Pt-TiO<sub>2</sub> (Micro-flower) shows good photocatalytic activity at H<sub>2</sub> production test

