

Evaluation of Solar-Driven Photocatalytic Activity of Thermal Treated TiO₂ under Various Atmospheres

Reza Katal ¹, Saeideh Kholghi Eshkalak ², Saeid Masudy-panah ³, Mohammadreza Kosari ⁴, Mohsen Saeedikhani ⁵, Mehrdad Zarinejad ^{6,*} and Seeram Ramakrishna ^{2,*}

¹ Department of Civil & Environmental Engineering, National University of Singapore, Singapore 117576, Singapore; reza.katal@u.nus.edu

² Department of Mechanical Engineering, Center for Nanofibers and Nanotechnology, National University of Singapore, Singapore 117575, Singapore; s.kholghi143@gmail.com

³ Department of Electrical and Computer Engineering, National University of Singapore, Singapore 119260, Singapore; saeid1@e.ntu.edu.sg

⁴ Department of Chemical and Biomolecular Engineering, Faculty of Engineering, National University of Singapore 119260, Singapore; kosari@u.nus.edu

⁵ Department of Materials Science and Engineering, National University of Singapore, Singapore 117583, Singapore; saeedikhani@u.nus.edu

⁶ Singapore Institute of Manufacturing Technology (SIMTech), A*STAR (Agency for Science, Technology and Research), Singapore 138634, Singapore

* Correspondence: mehrdad@simtech.a-star.edu.sg (M.Z.); seeram@nus.edu.sg (S.R.); Tel.: +65-6516-4805 (S.R)

Table S1. The surface area of samples.

Samples	Surface area (m ² /g)
P25	50.1
A-400	38.2
V-400	37.9
H-400	37.8

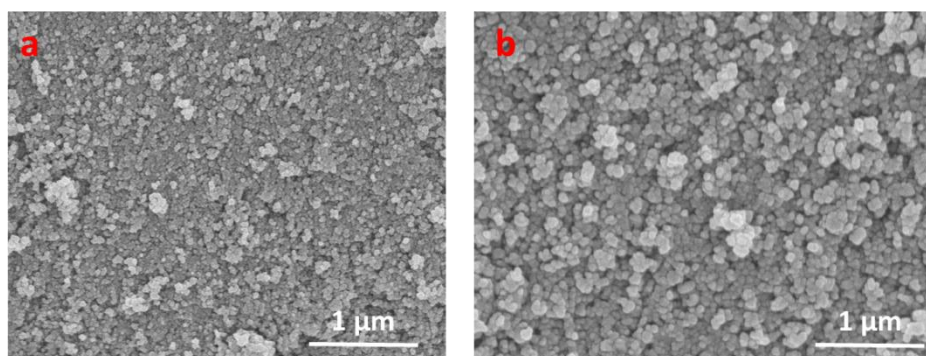


Figure S1. The SEM images of (a) P25 and (b) H-400.

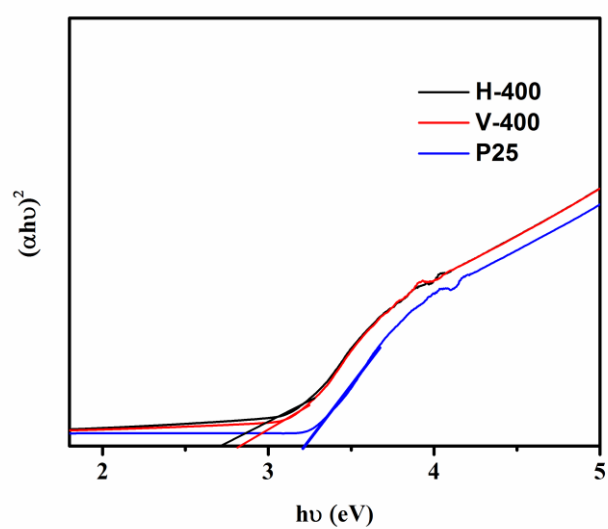


Figure S2. Plot of $(\alpha h\nu)^2$ versus $h\nu$ for H-400, V-400 and P25.

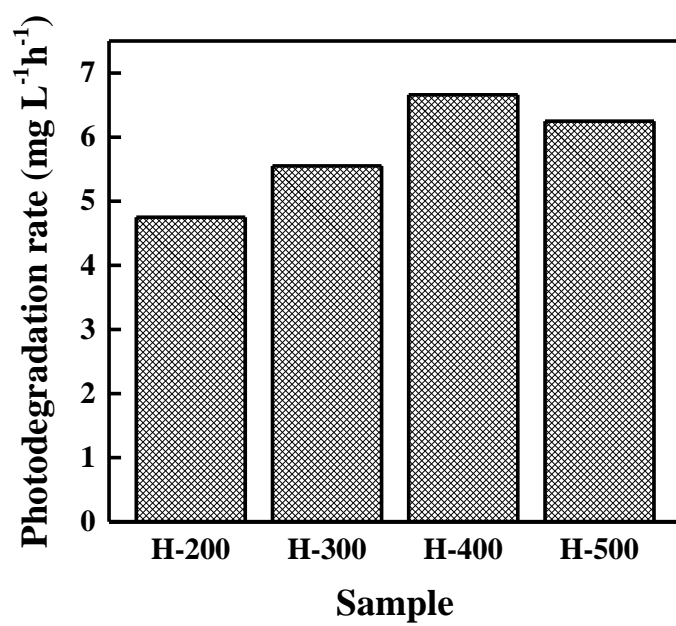


Figure S3. The photocatalytic degradation rate of hydrogenated samples under 1.5 G solar light illumination.

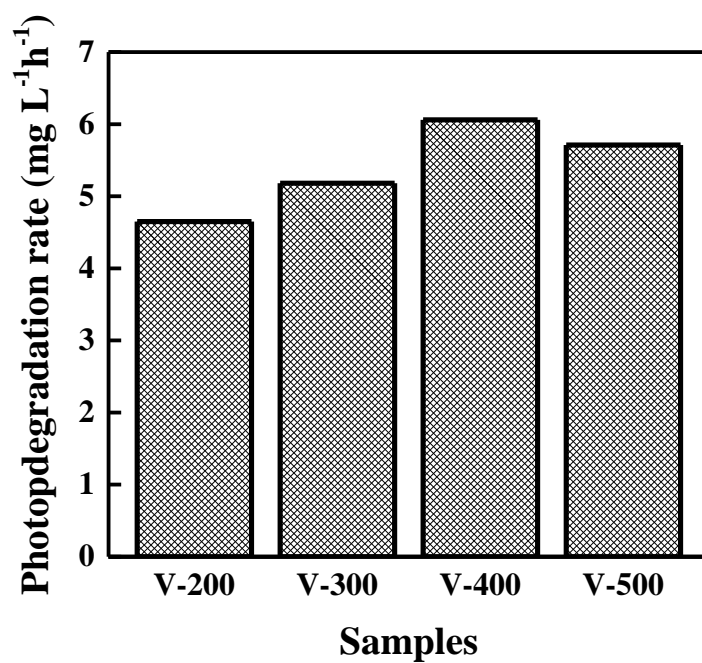


Figure S4. The photocatalytic degradation rate of calcined samples under vacuum under 1.5 G solar light illumination.

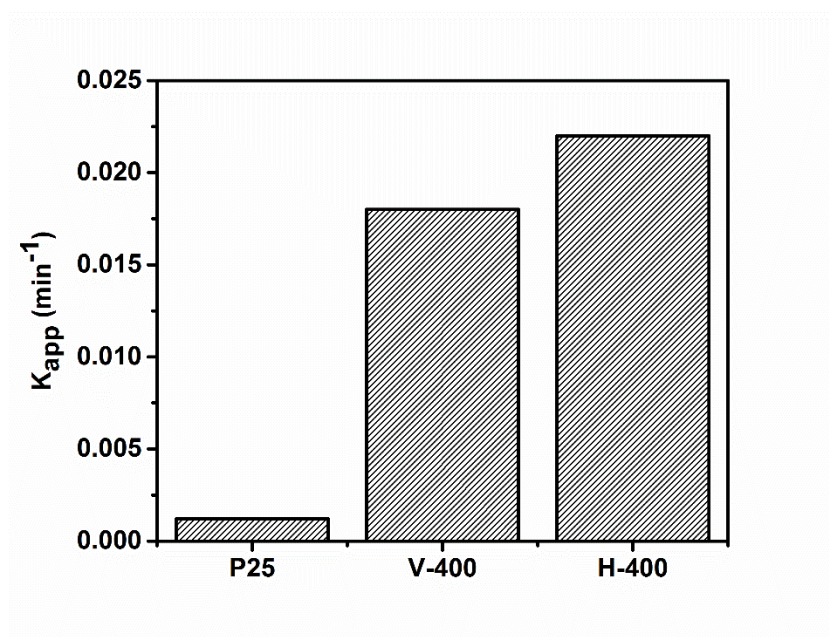


Figure S5. K_{app} (min⁻¹) of the samples under visible light irradiation.

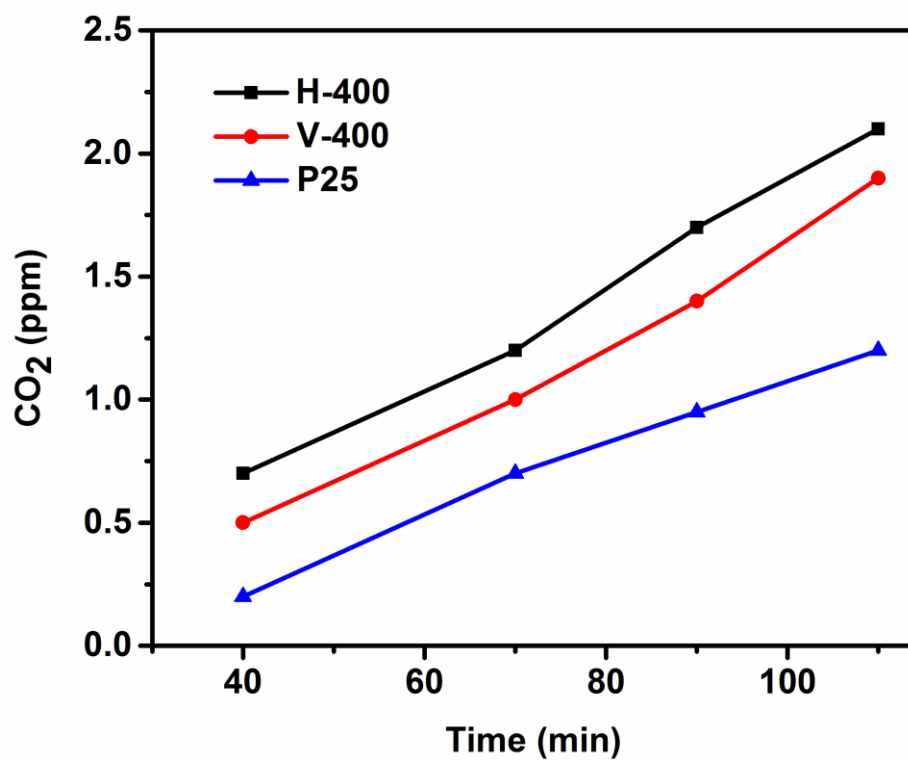


Figure S6. CO₂ production during the photocatalytic degradation of MB.

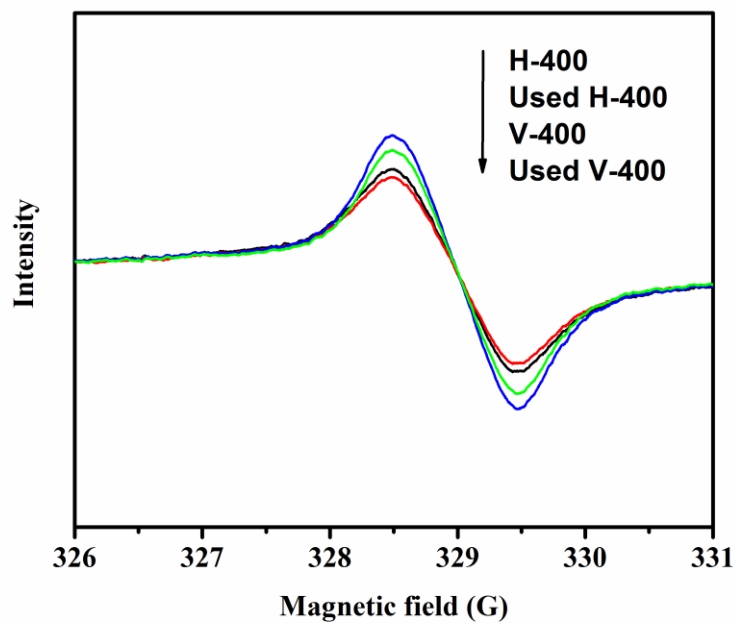


Figure S7. EPR spectra recorded at room temperature for fresh and used samples.

