

Photocatalytic Production of Dihydroxyacetone from Glycerol on TiO₂ in Acetonitrile

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Supplementary Data

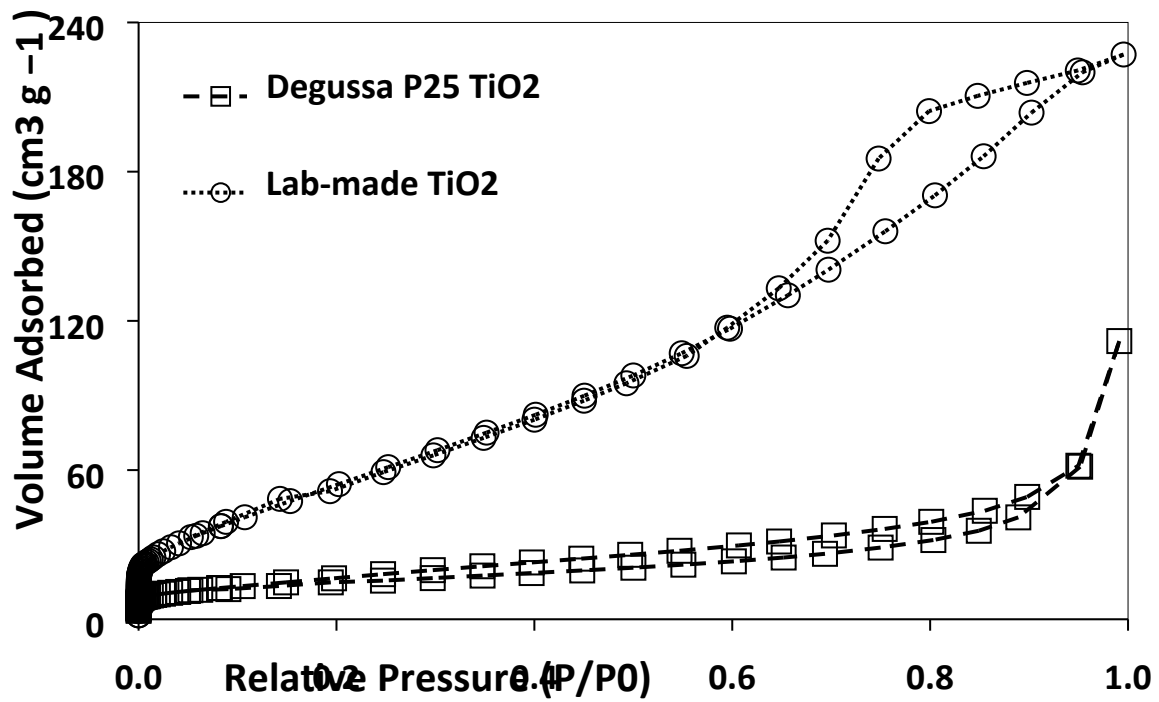


Fig. S. 1. Nitrogen adsorption-desorption isotherms for both Degussa P25 TiO₂ and lab-made TiO₂.

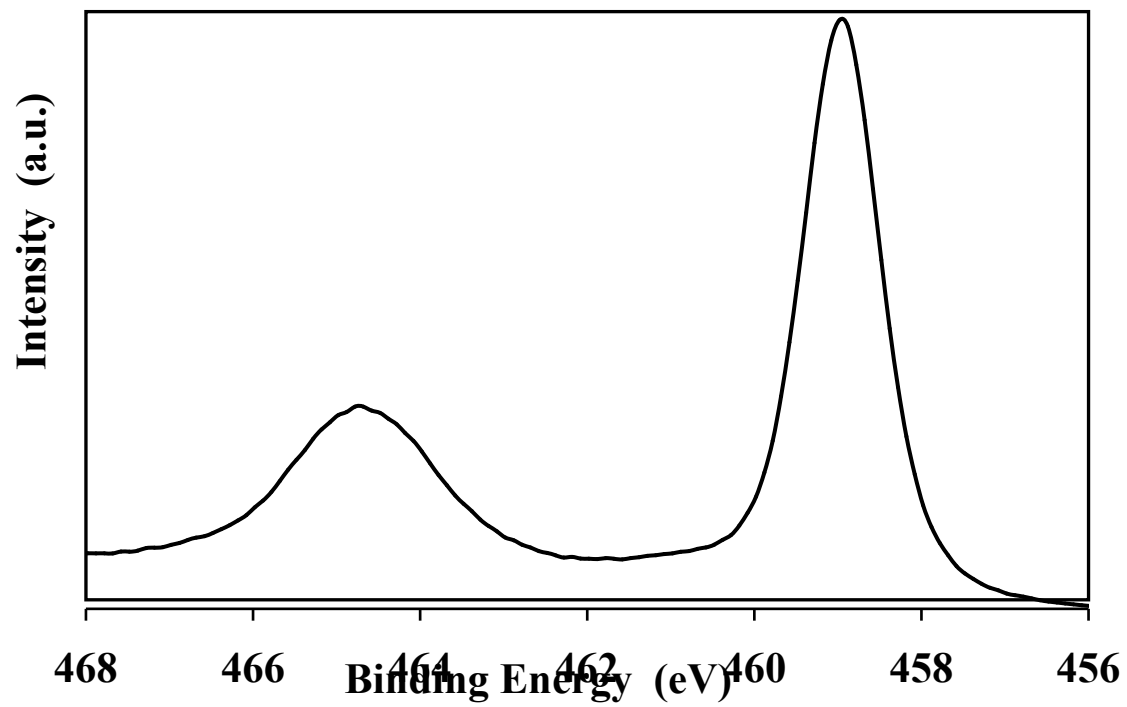


Fig. S. 2. High resolution XPS spectrum of lab-made TiO_2 Ti 2p_{3/2} at 458.88 eV and Ti 2p_{1/2} 464.68 eV to confirm synthesis of lab-made TiO_2 .

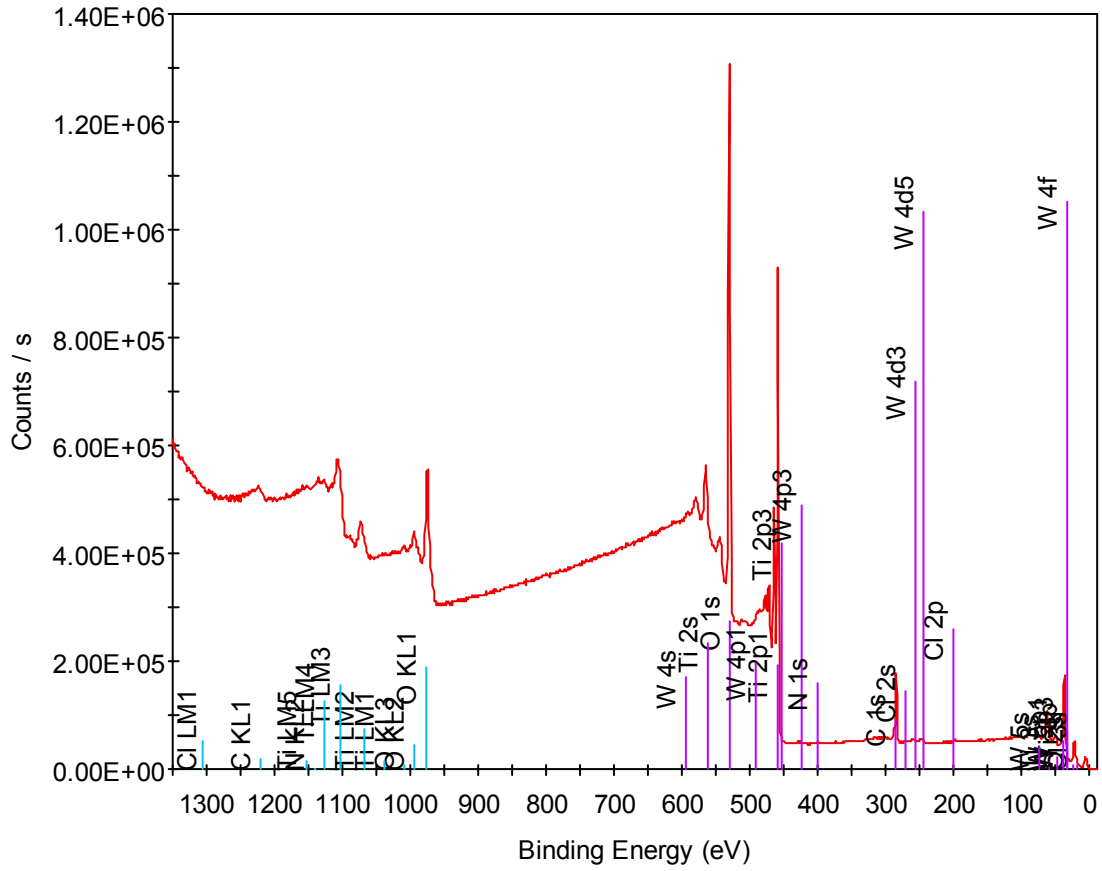


Fig. S. 3. Broad scan XPS of lab-made TiO_2 quantified to contain 27.30% Ti, 55.24% O, 16.39% C, 0.65% N, 0.29% Cl and 0.13% W (atomic percent).

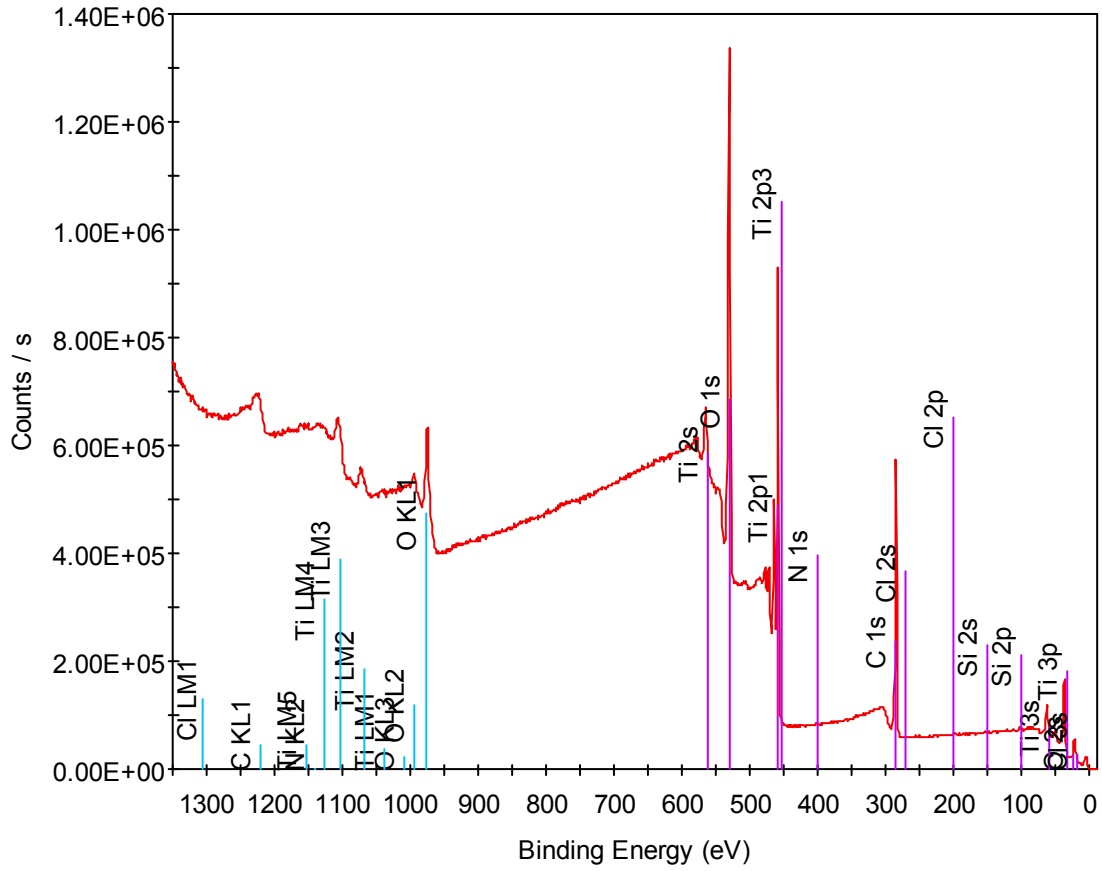


Fig. S. 4. Broad scan XPS of as received Degussa P25 TiO_2 quantified to contain 16.15% Ti, 37.30% O, 45.95% C, 0.13% N, 0.16% Cl and 0.31% Si (atomic percent).

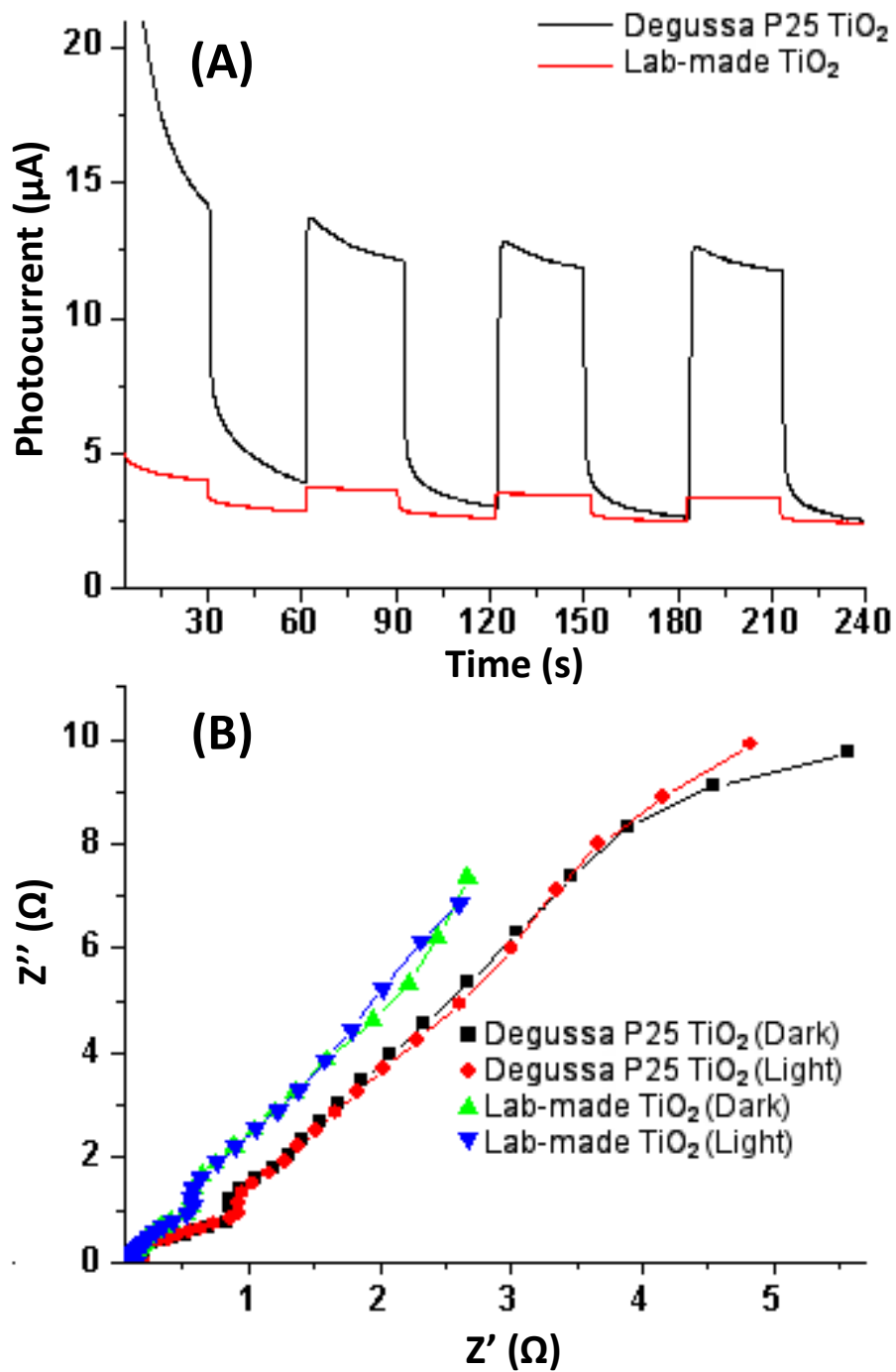


Fig. S. 5. Photocurrent testing in aqueous sodium sulfate solution with applied bias potential (0.8 V, Ref) (A), and EIS test in sodium sulfate solution with applied bias potential (0.8V, Ref) (B).

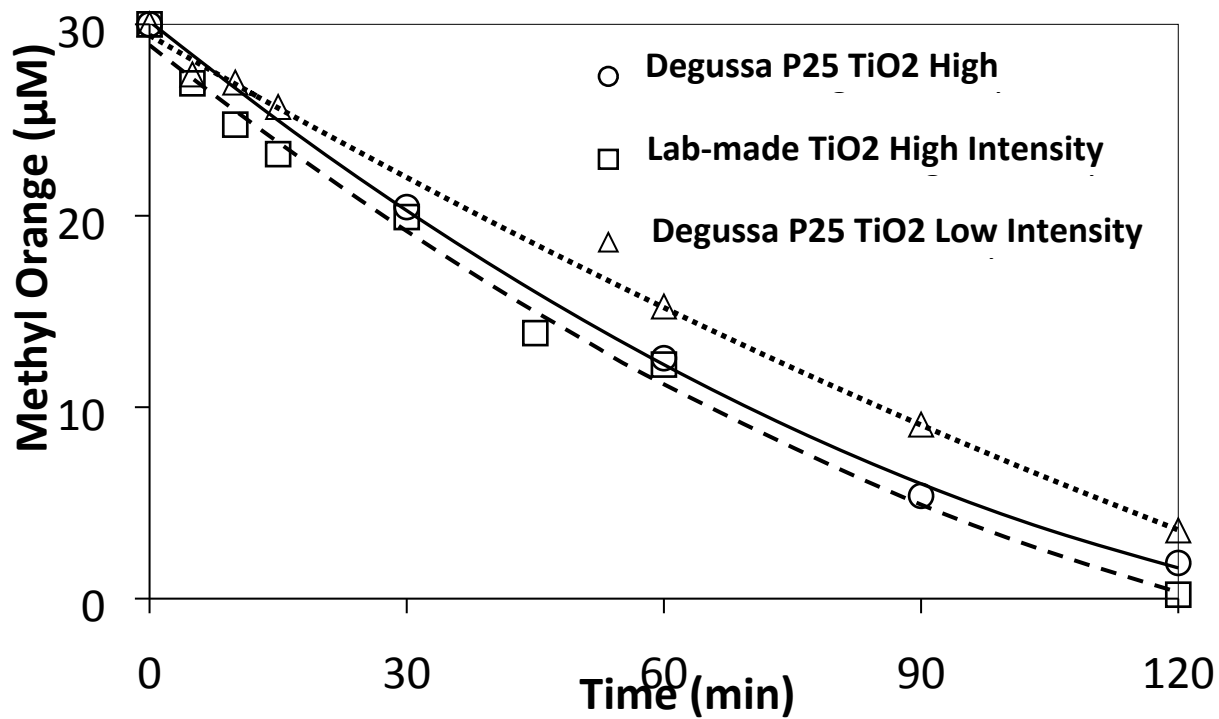


Fig. S. 6. Comparison of Degussa P25 TiO₂ and lab-made TiO₂ for the photocatalytic degradation of methyl orange in water under high and low intensity simulated solar light. Water: 100 mL, initial methyl orange concentration: 30 μM , Degussa P25 TiO₂ or lab-made TiO₂: 1 g/L.

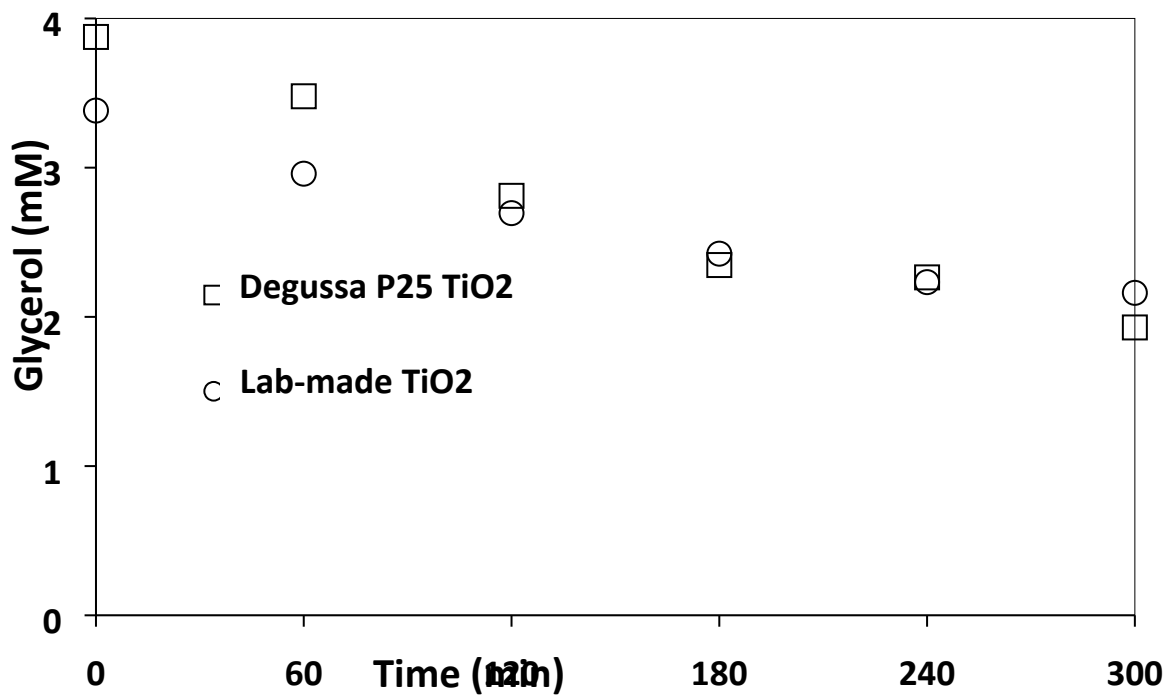


Fig. S. 7. Degradation of glycerol in water with Degussa P25 TiO₂ or lab-made TiO₂ under low intensity simulated solar light. Water: 100 mL, glycerol concentration: 4 mM, Degussa P25 TiO₂ or lab-made TiO₂:

1 g/L.

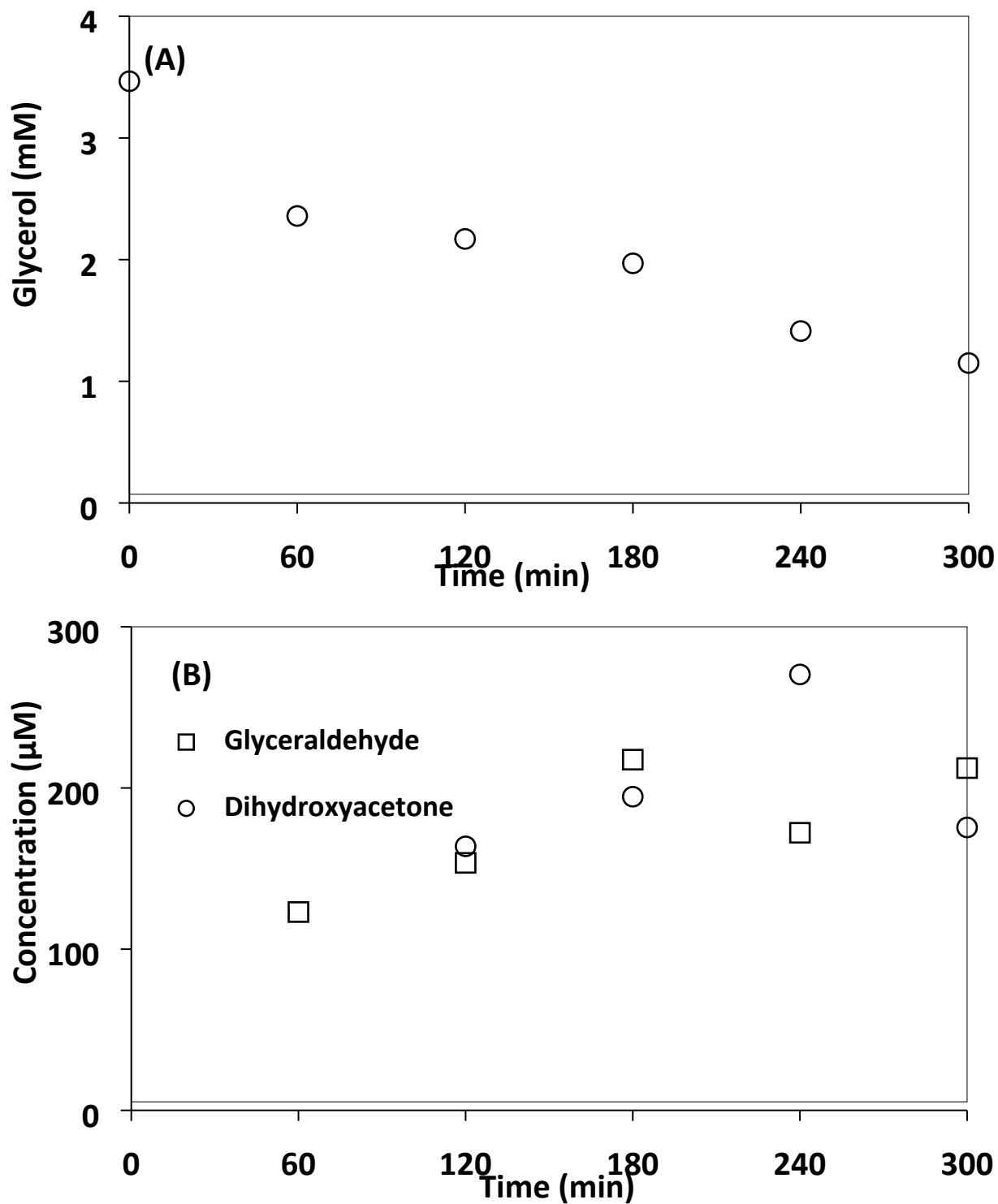


Fig. S. 8. (A) Degradation of glycerol, and (B) generation of dihydroxyacetone (DHA) glyceraldehyde (GAD) in acetonitrile with Degussa P25 TiO_2 under low intensity simulated solar light. Acetonitrile: 100 mL, glycerol concentration: 4 mM, Degussa P25 TiO_2 : 1 g/L.

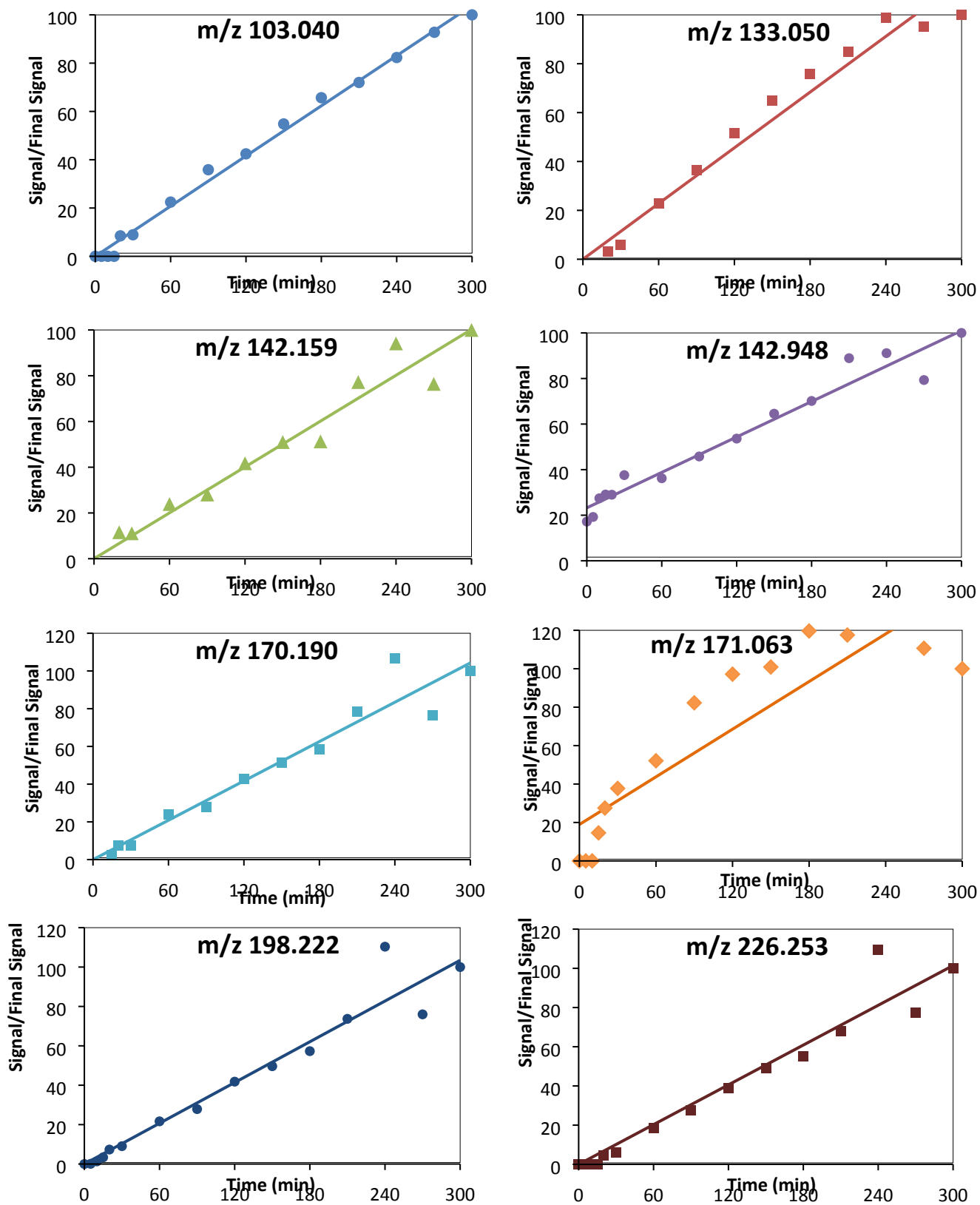


Fig. S. 9. The HPLC-MS signal showing the generation of various species over time during the photocatalytic reaction of glycerol in acetonitrile under solar simulated light.