Supporting Information

Influence of Carbonaceous Species on Aqueous Photocatalytic Nitrogen Fixation by Titania

Yu-Hsuan Liu\textsuperscript{a}, Manh Hiep Vu\textsuperscript{b,\dagger}, JoenHoon Lim\textsuperscript{c}, Trong-On Do\textsuperscript{b,\dagger} and Marta C. Hatzell\textsuperscript{c,*}

\textsuperscript{a} School of Civil and Environmental Engineering, Georgia Institute of Technology, Atlanta, Georgia 30332

\textsuperscript{b,\dagger} Department of Chemical Engineering, Laval University, Rue de l'Université, Québec, QC G1V 0A6, Canada

\textsuperscript{c, * George W. Woodruff School of Mechanical Engineering, Georgia Institute of Technology, Atlanta, Georgia 30313

E-mail: *marta.hatzell@me.gatech.edu
Fig. S1 Rotating ring disk electrode experiments with and without light illumination in argon and nitrogen atmospheres on Pt disc.
Fig. S2 Rotating ring disk electrode experiments with light illumination in nitrogen gas on rutile TiO$_2$ in three phases. Each phase presented the same catalyst by recycling. (a) Comparison of phase 1 and 3. (b) phase 2 with methanol addition
Fig. S3 Other carbonaceous species effect on photo-catalytic testing by rutile TiO$_2$ in phase 3 including methanol, ethanol and formic acid.