

Supporting Information

Ultraviolet Radiation Induced Dopant Loss in a TiO₂ Photocatalyst

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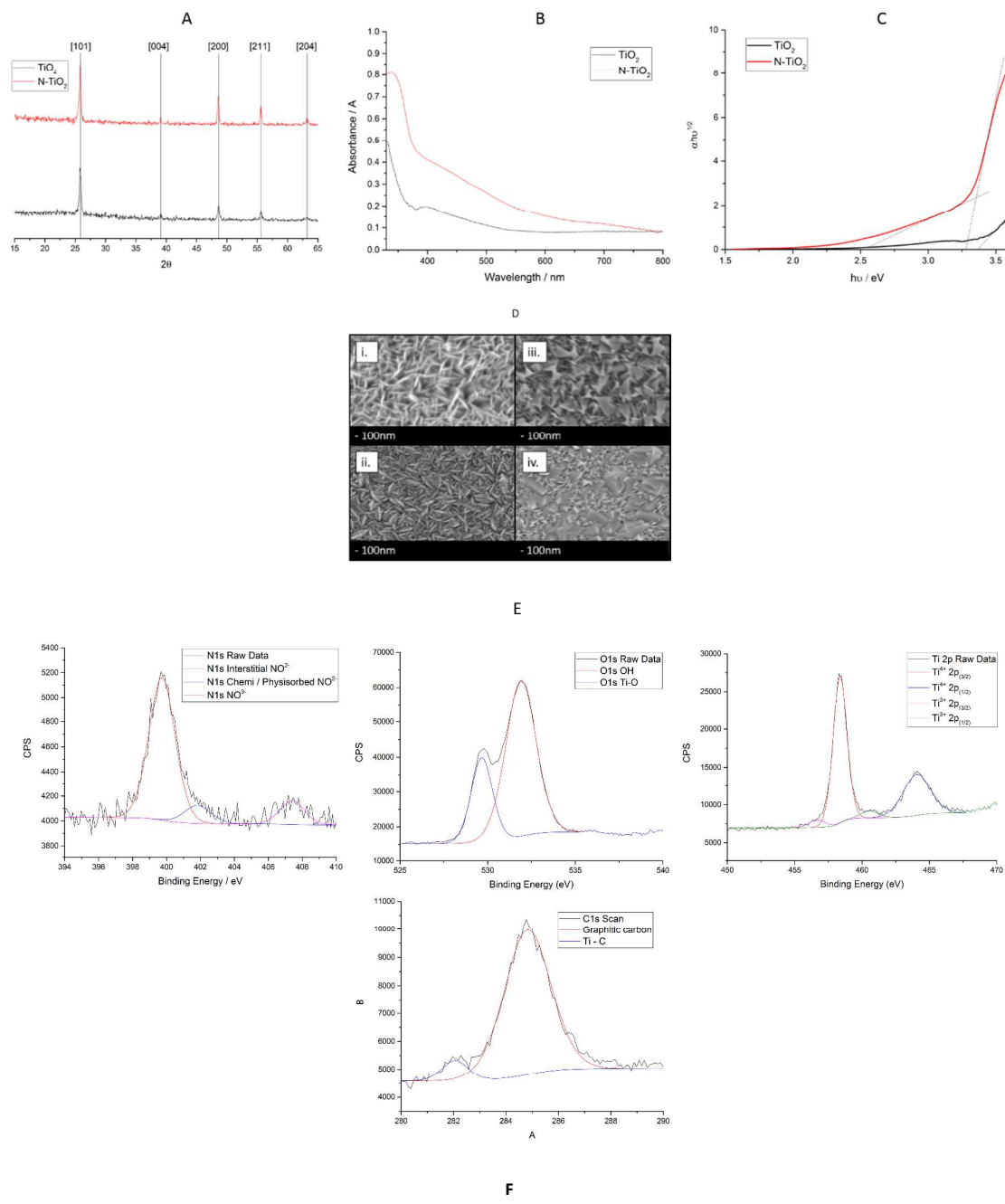
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| Days of UVA exposure | 0 | 4 | 7 | 11 | 15 | 18 | 21 | 24 | 28 |
|----------------------|------|------|------|------|------|------|------|------|------|
| C % | 0.54 | 0.86 | 1.02 | 0.52 | 0.66 | 0.39 | 0.52 | 0.47 | 0.52 |

Figure S1: 1. A.) XRD data shows that the anatase structure was adopted for both TiO_2 and N-TiO_2 . B.) Tauc plots showing a red shift in the bandgap from 3.2 eV in TiO_2 to 2.51 eV in N-TiO_2 . C.) Significant visible light absorption is found in N-TiO_2 compared to TiO_2 using UV – Visible absorption spectroscopy. D.) SEM images i. TiO_2 pre UV-treatment, ii. TiO_2 post UV-treatment, iii. N-TiO_2 pre UV-treatment, iv. N-TiO_2 post UV-treatment. E.) XPS spectra for the N1s, O1s, Ti2p and C1s binding energy regions, demonstrating bonding environments typical for nitrogen doped TiO_2 . F.) table comparing Ti-C bond concentration as a function of irradiation time.

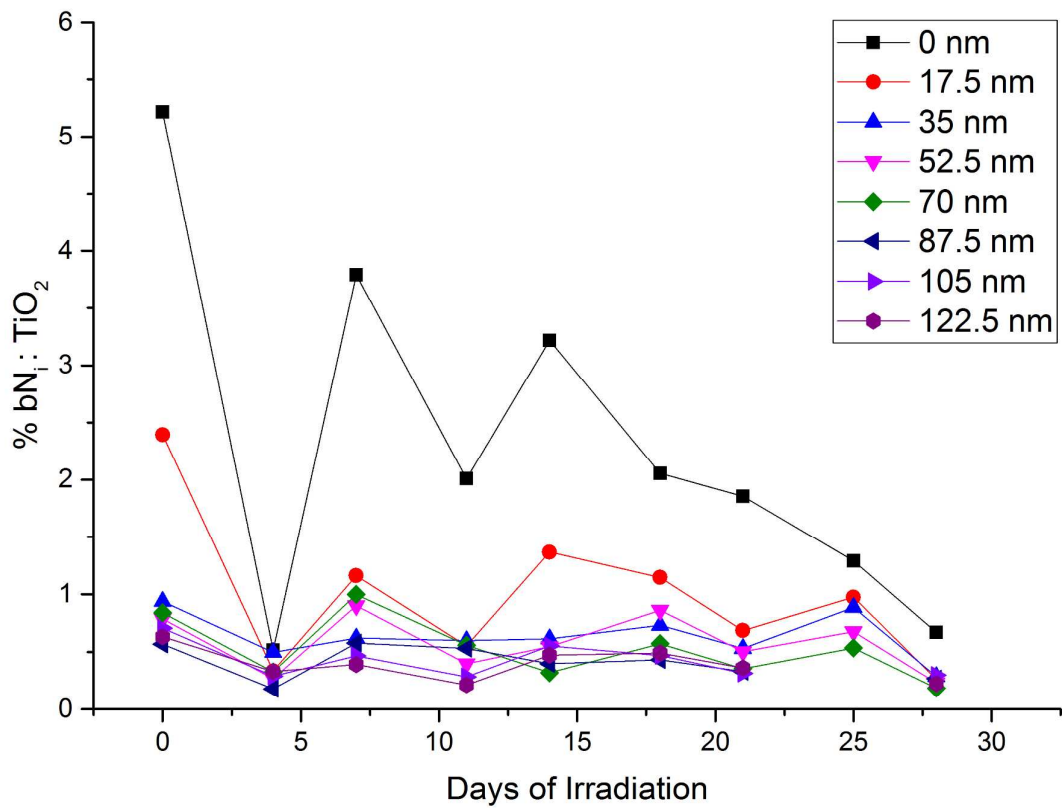


Figure S2: Graph of bulk interstitial nitrogen (bN_i) concentration, as calculated from XPS, for every depth profile conducted over 28 days' worth of irradiation.

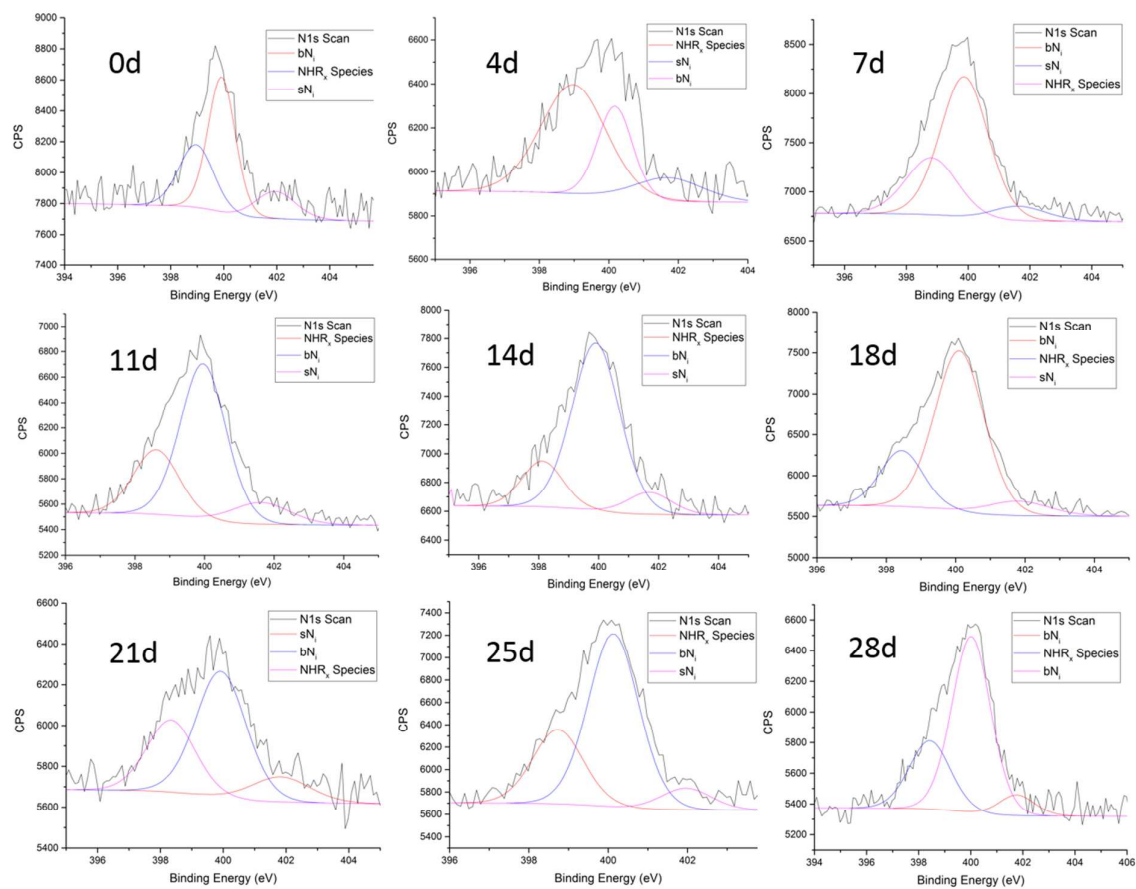


Figure S3: All modelled XPS spectra used to calculate bN_i and sN_i . NHR_x peaks at ~ 398 eV are necessary for a correct fit.

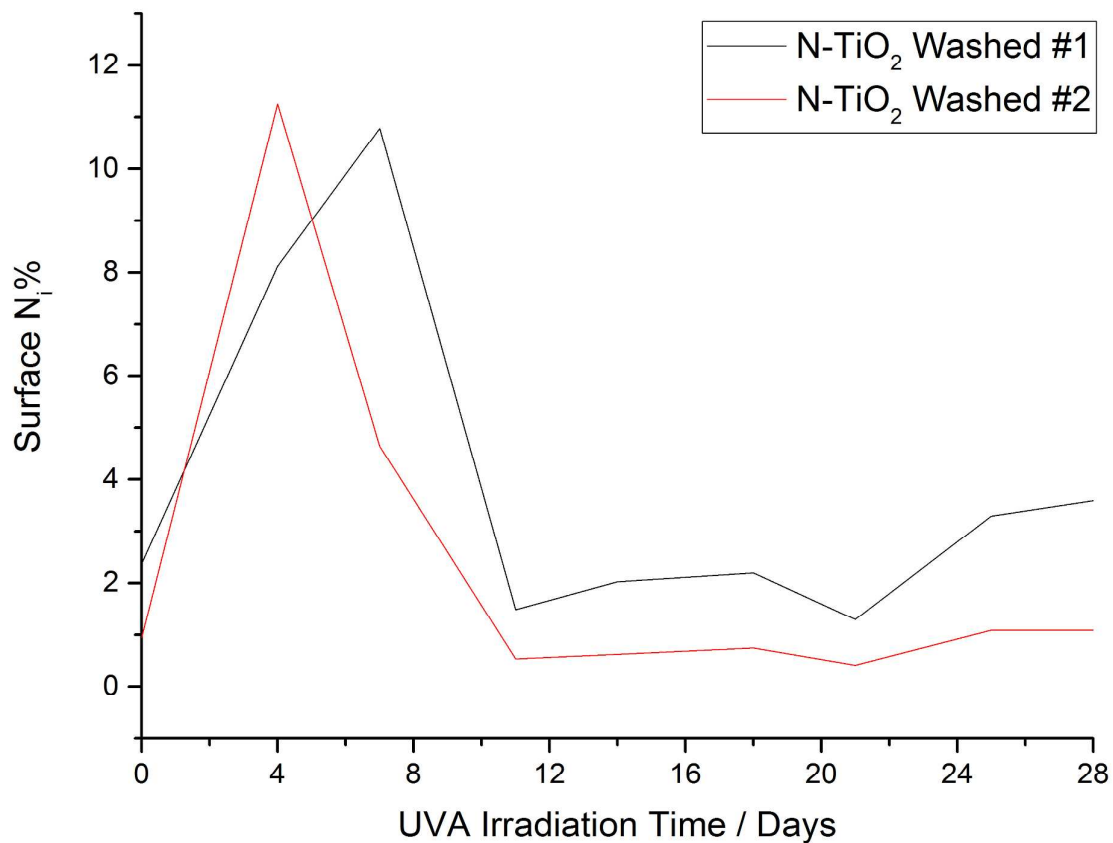


Figure S4: Data from previous studies showing surface nitrogen concentration of N-TiO₂ samples as a function of irradiation time. Each sample represents an individually synthesised sample and the peak and subsequent loss of surface interstitial nitrogen is evident in each sample. The peak occurs around 4-7 days which is mirrored in the current study. These samples were washed every day for 28 days with deionised water, which was not done in the current study to preserve the presence of interstitial nitrogen species and isolate the effect of UV irradiation on its own.