

On the Underlying Mechanisms of the Low Observed Nitrate Selectivity in Photocatalytic NO_x Abatement and the Importance of the Oxygen Reduction Reaction

Julia Patzsch,^a Andrea Folli,^b Donald E. Macphee^c and Jonathan Z. Bloh^{*a}

Supporting Information

^a *DECHEMA-Forschungsinstitut, Theodor-Heuss-Allee 25, 60486 Frankfurt am Main, Germany; E-mail: bloh@dechema.de*

^b *School of Chemistry, Cardiff University, Main Building, Park Place, Cardiff CF10 3AT, Wales, United Kingdom.*

^c *University of Aberdeen, Department of Chemistry, Meston Walk, Aberdeen AB24 3UE, United Kingdom.*

The following measurements were performed on a different batch of P25, therefore the numbers slightly deviate from the experiments reported in Figure 1+3 and Table 1.

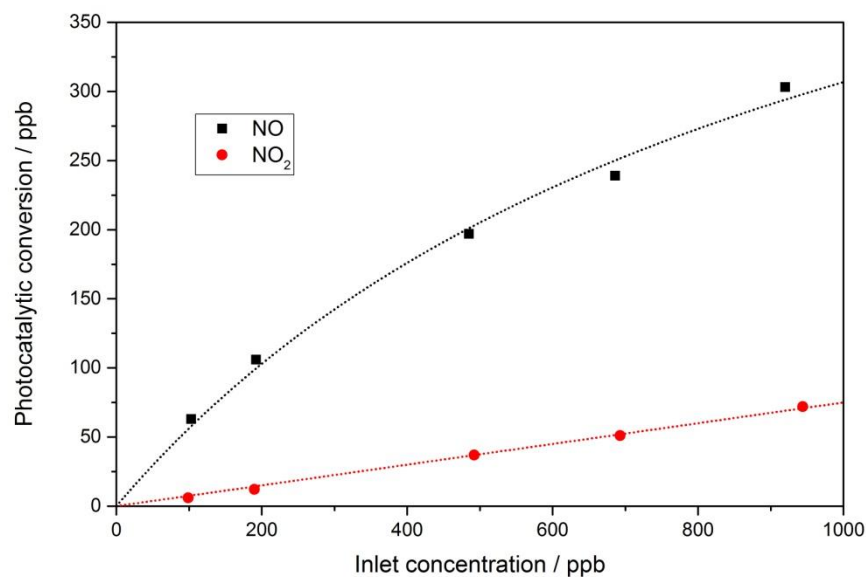


Figure S1 The photocatalytic conversion of NO and NO₂ over P25 with varying inlet concentrations. Conditions according to ISO 22197-1 except inlet concentration, the conversion was calculated from the concentrations present after 4h of illumination.

Table S1 Conversion of NO and NO₂ with varying inlet concentrations, determined in separate experiments over illuminated P25, conditions and setup according to ISO 22197-1 except inlet concentration. Conversion and selectivity were calculated from the concentrations present after 4h of illumination.

Inlet NO concentration	NO Conversion	Selectivity (4h)	Inlet NO ₂ concentration	NO ₂ Conversion	k _{NO}	k _{NO2}	k _{NO} /k _{NO2}
920 ppb	32.9%	15.6%	944 ppb	7.6%	0.799	0.159	5.0
686 ppb	34.8%	14.8%	642 ppb	7.4%	0.857	0.153	5.6
485 ppb	40.1%	13.1%	455 ppb	7.5%	1.025	0.156	6.6
192 ppb	55.2%	12.8%	178 ppb	6.3%	1.606	0.130	12.3
103 ppb	61.2%	15.1%	93 ppb	6.1%	1.892	0.125	15.1

Figure S2 The change in NO, NO₂ and total NO_x concentrations upon illumination of a P25 sample. Inlet concentrations approximately 500 ppb NO and 500 ppb NO₂. Conditions and setup otherwise according to ISO 22197-1.

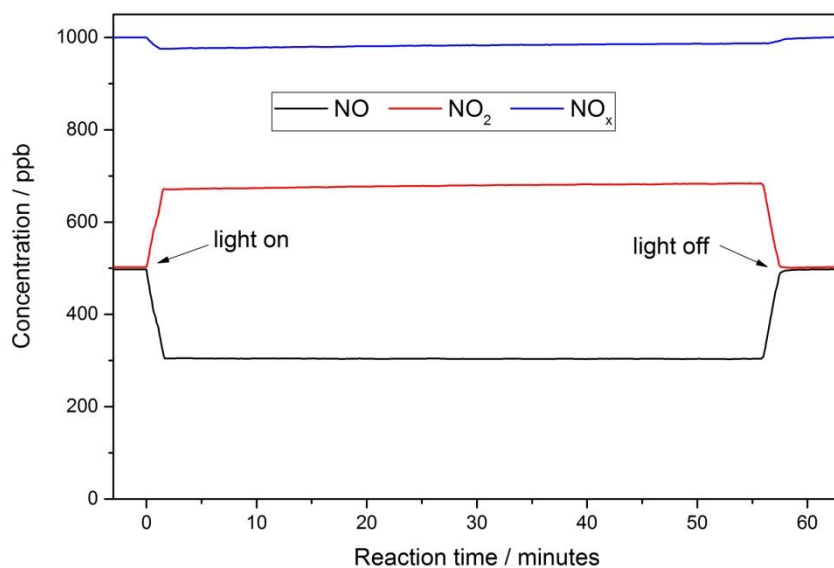


Figure S3 The change in NO, NO₂, total NO_x and ozone concentrations upon illumination of a P25 sample. Inlet concentrations approximately 100 ppb NO, 100 ppb NO₂ and 40 ppb O₃. Conditions and setup otherwise according to ISO 22197-1.

