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The positive effect of formaldehyde on the photocatalytic renoxification of nitrate on TiO_2 particles

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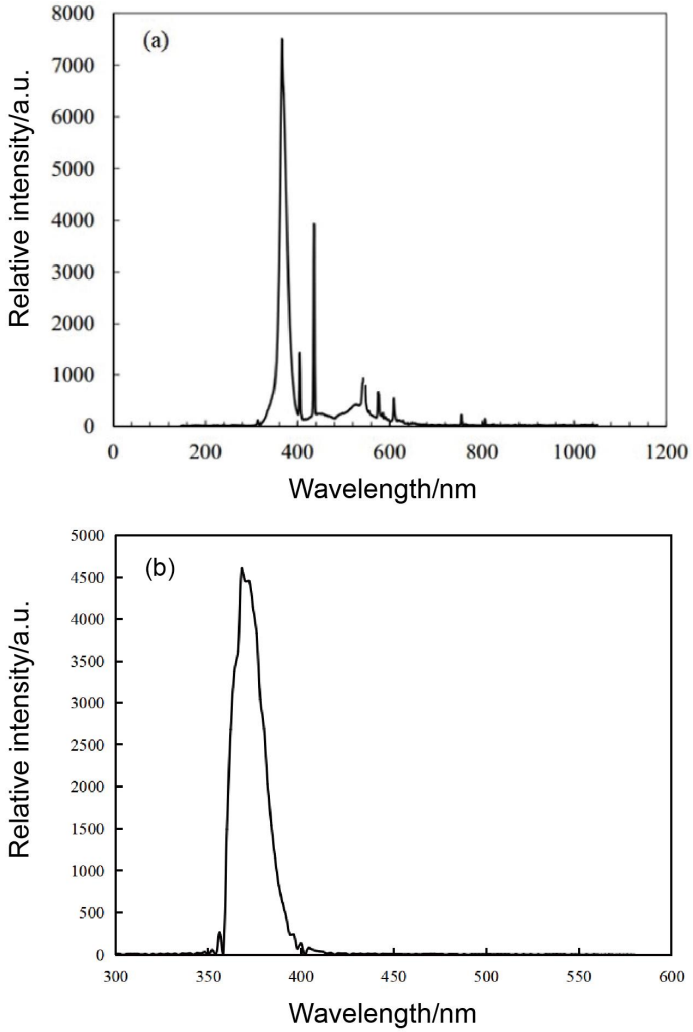

Figure S1. Spectral energy distribution of (a) 365 nm tube lamps and (b) 365 nm LED lamps.

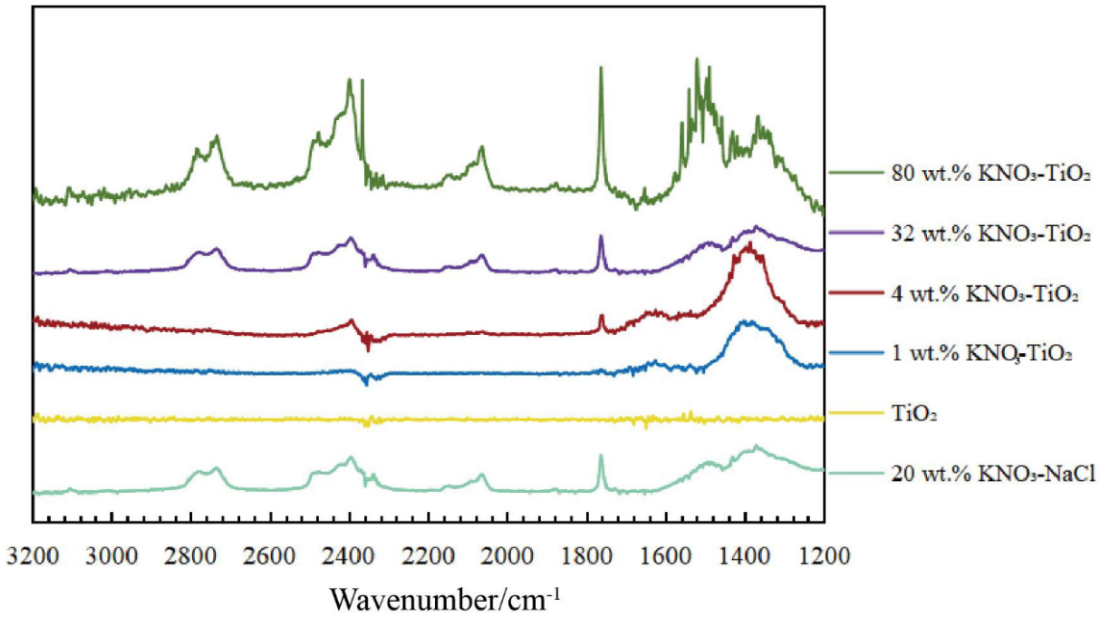

Figure S2. DRIFTS spectra of TiO_2 particles compounded with different mass fractions of KNO_3.

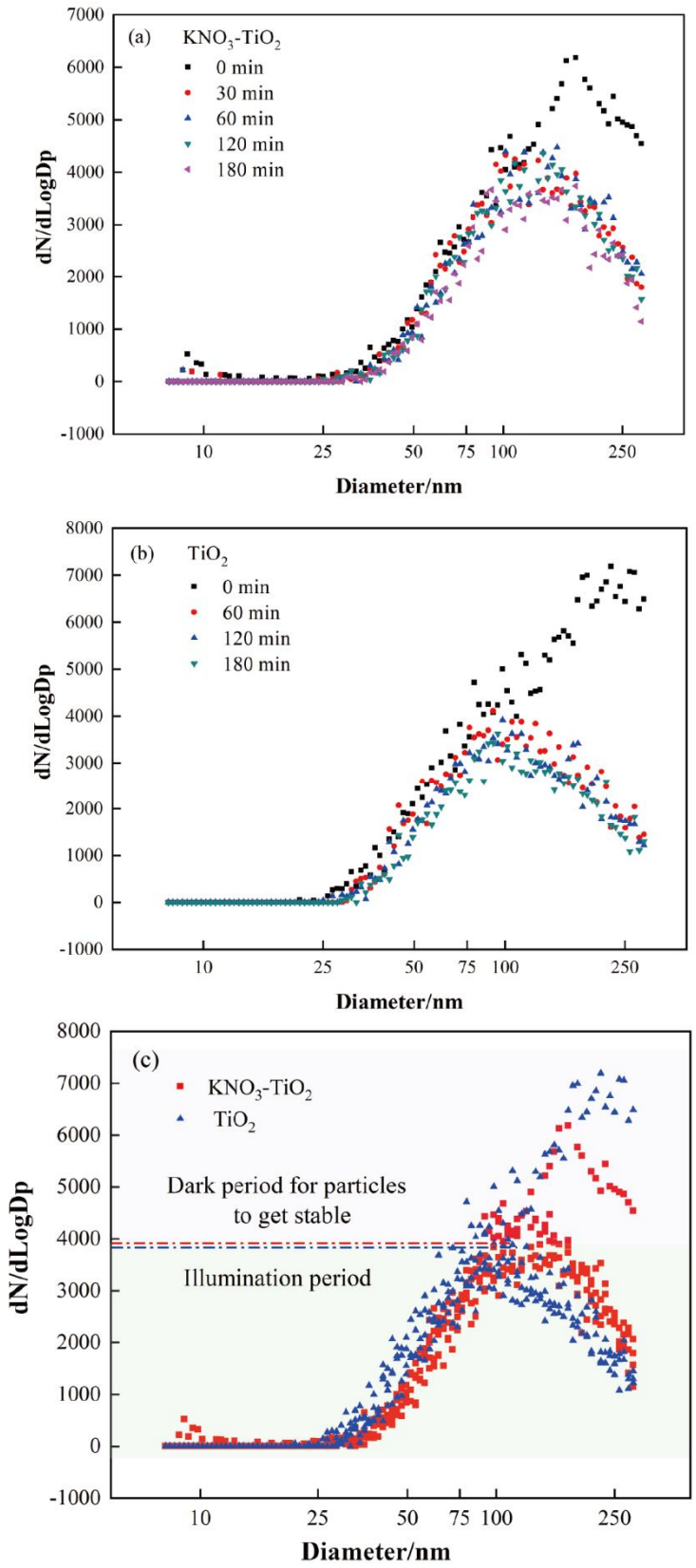

Figure S3. Particle size distribution of 4 wt.% KNO_3-TiO_2 (a), TiO_2 (b) and comparison of 4 wt.% KNO_3-TiO_2 (red line) and TiO_2 (blue line) (c) in environmental chamber with time. (60 minute is the time of turning on the lamps)

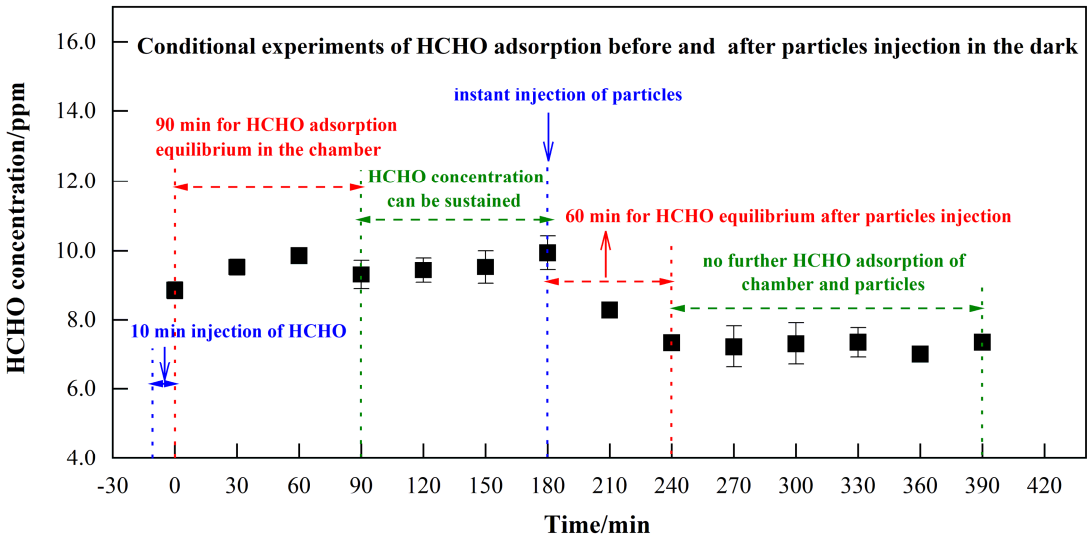

Figure S4. The conditional experiments of HCHO concentration in the environmental chamber in the dark before and after the introduction of particles over time.

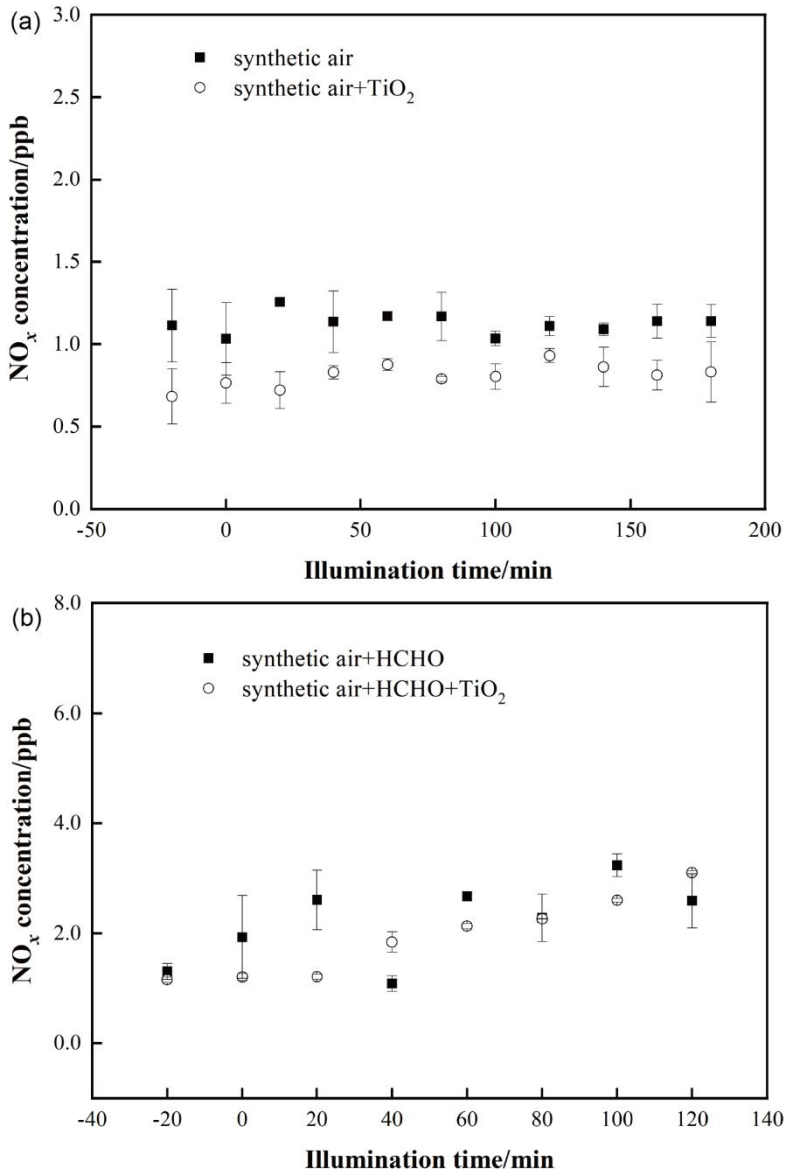

Figure S5. Changes of NO_x concentration in environmental chamber in (a) "synthetic air" and "synthetic air + TiO_2" system, (b) "synthetic air + HCHO" and "synthetic air + HCHO + TiO_2" system. 365 nm tube lamps were used during the blank experiment.

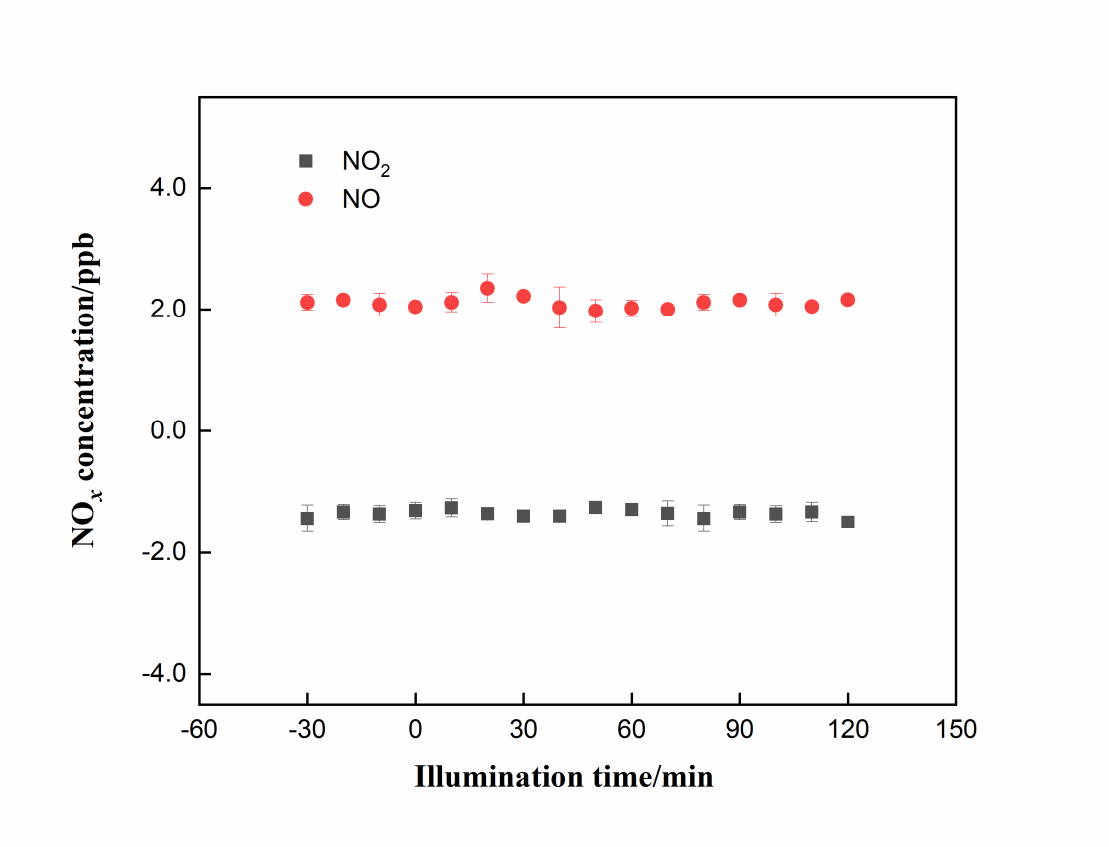

Figure S6. Effect of illumination on the release of NO and NO_2 over 4 wt.% KNO_3-TiO_2 at 293 K and 0.8% of relative humidity. 365 nm LED lamps were used during the illumination experiment.

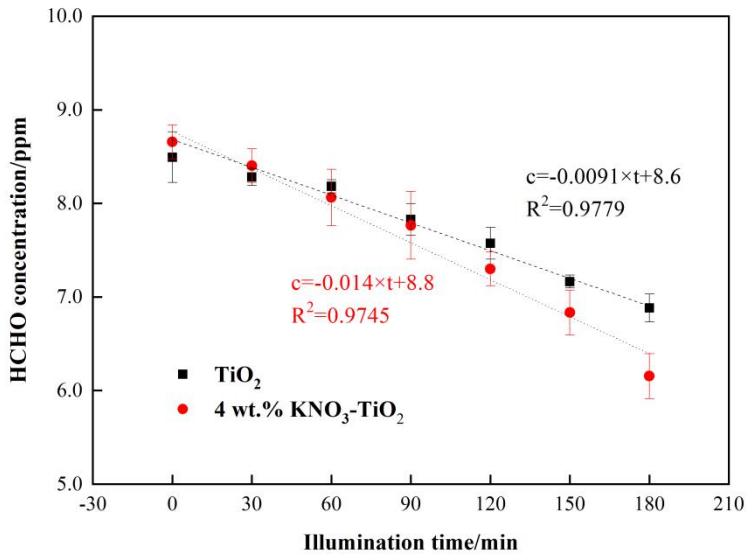

Figure S7. Photocatalytic degradation curve of HCHO on TiO_2 and 4 wt.% KNO_3-TiO_2 particles under 365 nm LED lamps at 293 K and 0.8% of relative humidity.

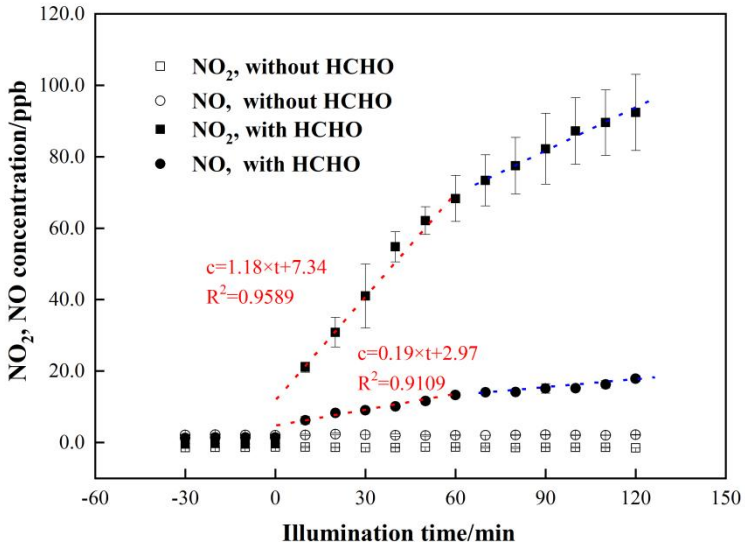

Figure S8. Effect of HCHO on the production of NO and NO_2 over 4 wt.% KNO_3-TiO_2 particles at 293 K and 0.8% of relative humidity. 365 nm LED lamps were used during the illumination experiment. The initial concentration of HCHO was about 9 ppm.

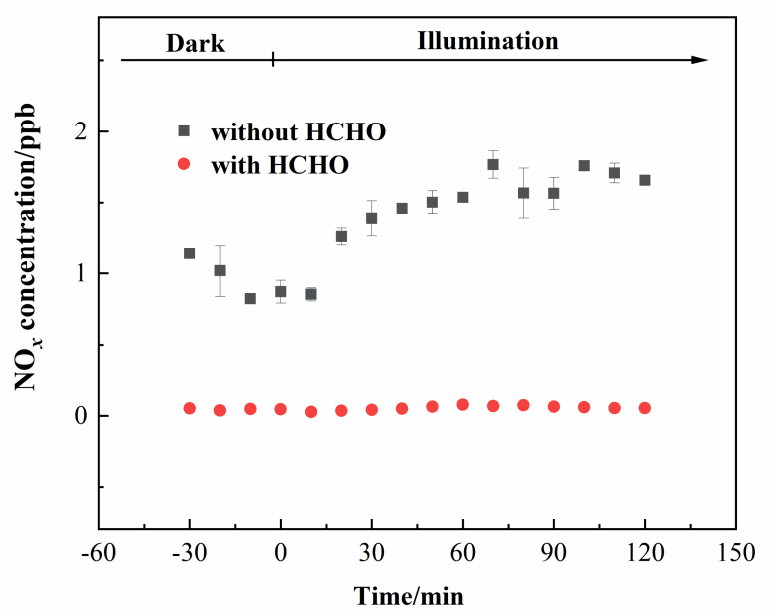

Figure S9. Effect of formaldehyde on the renoxification processes of 4 wt.% KNO_3-SiO_2 particles at 293 K and 0.8% of relative humidity. 365 nm LED lamps were used during the irradiation experiment. The initial concentration of HCHO was about 9 ppm.

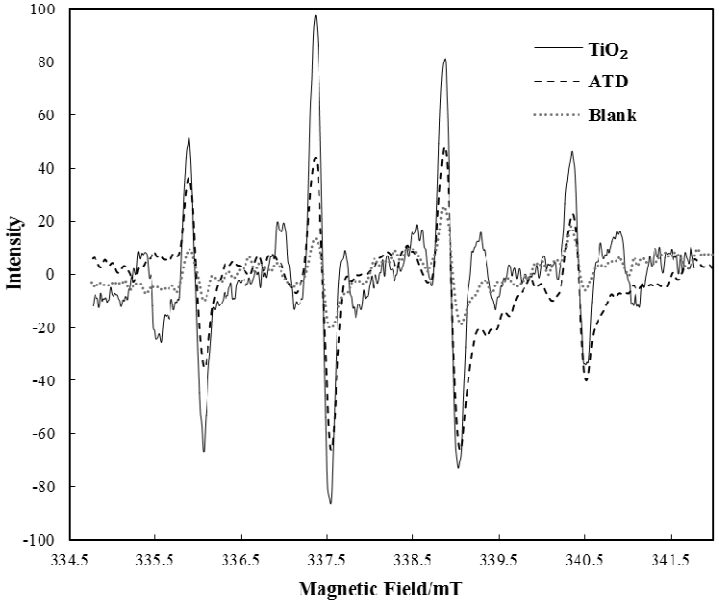

Figure S10. ESR spectra of irradiated TiO_2 and ATD particles.

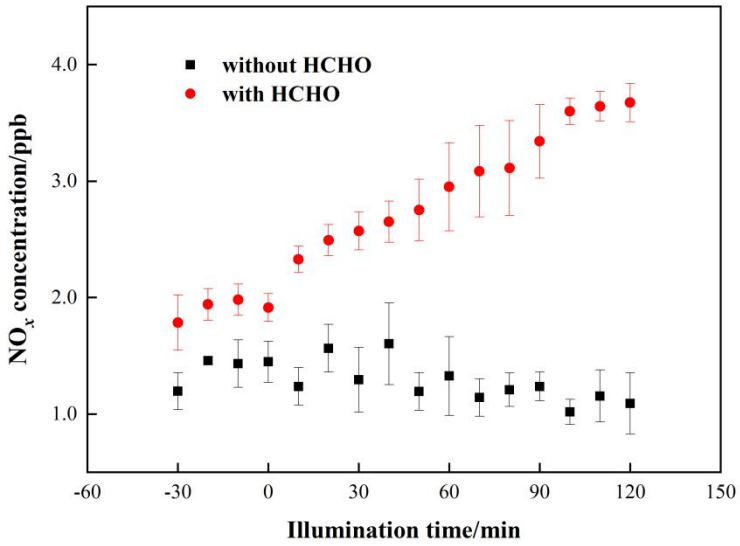

Figure S11. Effect of HCHO on the renoxification processes of Arizona Text Dust (ATD) at 293 K and 0.8% of relative humidity. 365 nm LED lamps were used during the illumination experiment. The initial concentration of HCHO was about 9 ppm.

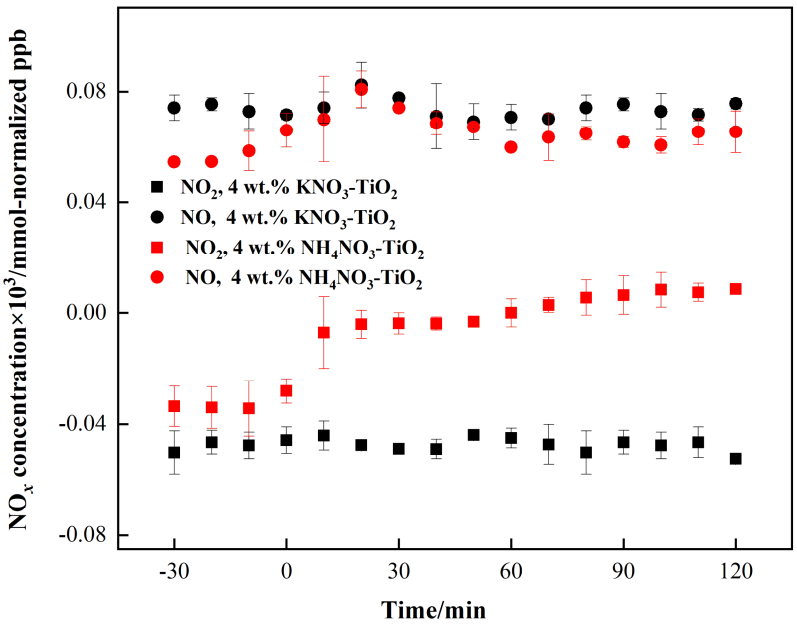

Figure S12. Change of NO_x concentration over 4 wt.% KNO_3-TiO_2 and 4 wt.% NH_4NO_3-TiO_2 particles at 293 K and 0.8% of relative humidity. 365 nm LED lamps were used during the illumination experiment.

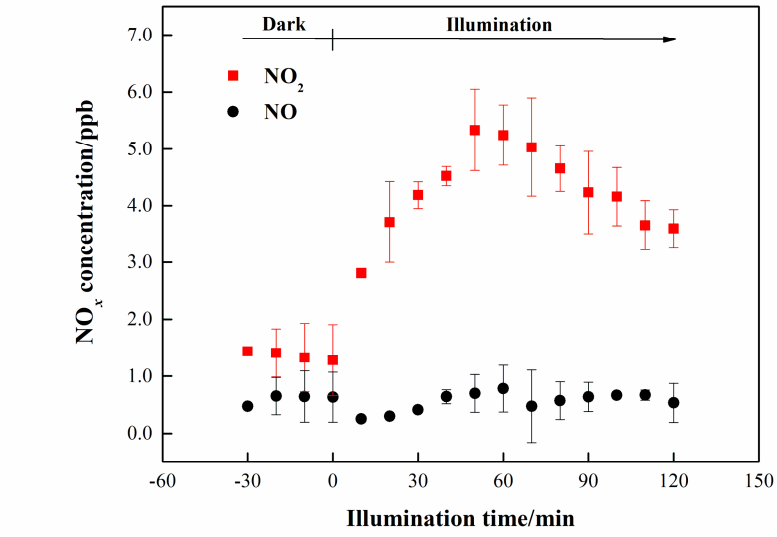

Figure S13. The release of NO_2 and NO with 365 nm LED lamps illumination over 4 wt.% KNO_3-TiO_2 particles at 293 K and 0.8% RH. The initial concentration of HCHO was about 1.0 ppm.

Table S1. Arizona Test Dust (ATD) chemical composition.

Chemical composition	Weight percentage (%)
SiO_2	68-76
Al_2O_3	10-15
Fe_2O_3	2.0-5.0
Na_2O	2.0-4.0
CaO	2.0-5.0
MgO	1.0-2.0
TiO_2	0.5-1.0
K_2O	2.0-5.0

*Loss on Ignition 2-5 %