Supporting Information

High-efficiency removal of NO_x using a combined adsorption-discharge plasma catalytic process

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Number of figures: 6

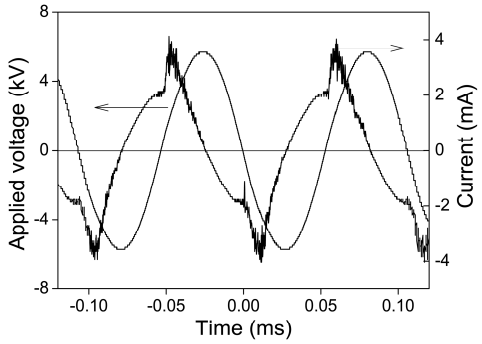

Figure S1. Waveforms of applied voltage and discharge current of the plasma.

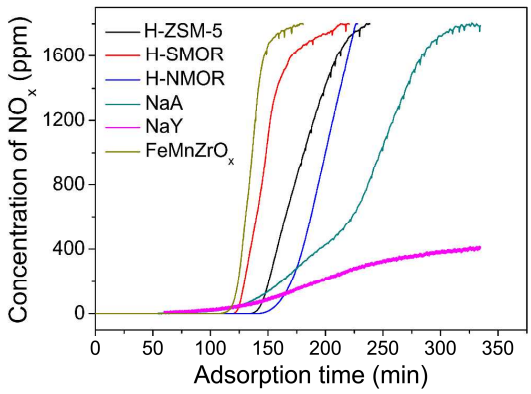

Figure S2. Breakthrough curves of NO_x on the catalysts.

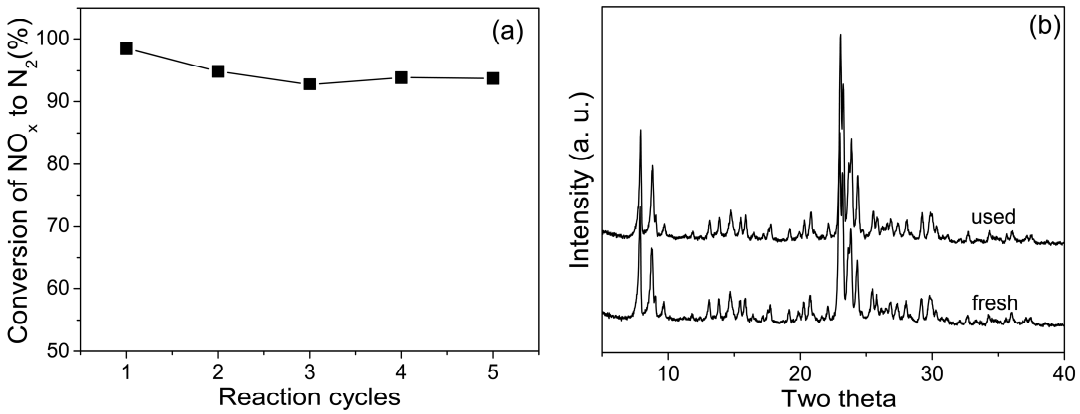

Figure S3. Cyclic performance of H-ZSM-5 in the adsorption-discharge process for NO_x removal (a) conversion of adsorbed NO_x (b) XRD patterns of H-ZSM-5 before and after 5-cycles' operation.

Conditions: in the adsorption stage, H-ZSM-5 adsorbed 0.645 mmol NO_x; in the

discharge stage, 50 mL/min flow rate of Ar, discharge power is set at 3.6 W, total input energy of the plasma is fixed at 0.832 W·h.

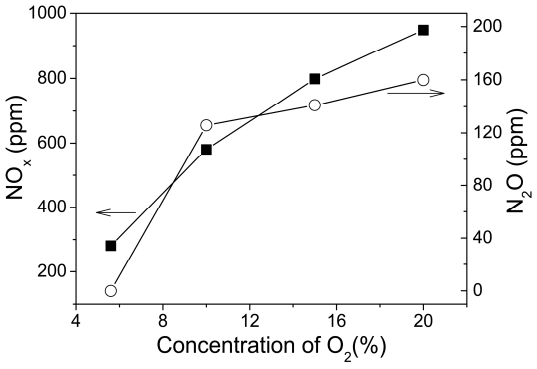

Figure S4. Reaction of O_2 with N_2 as a function of O_2 concentration in the DBD reactor.

Conditions: 50 mL/min of total flow rate, discharge power is set at 1.92 W.

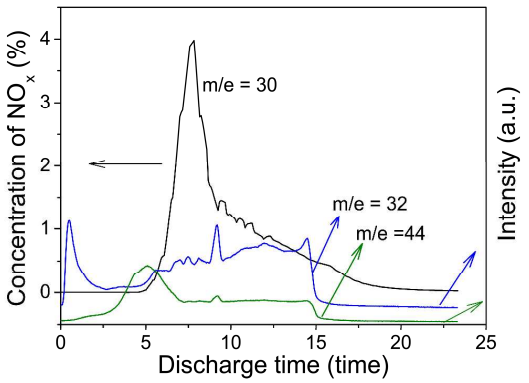

Figure S5. Effluents monitored by MS during decomposition of adsorbed NO_x on H-ZSM-5 in N_2 plasma at a discharge power of 3.6 W.

Notably, the MS signal $m/e = 30$ represents NO_x (NO + NO_2) in our MS

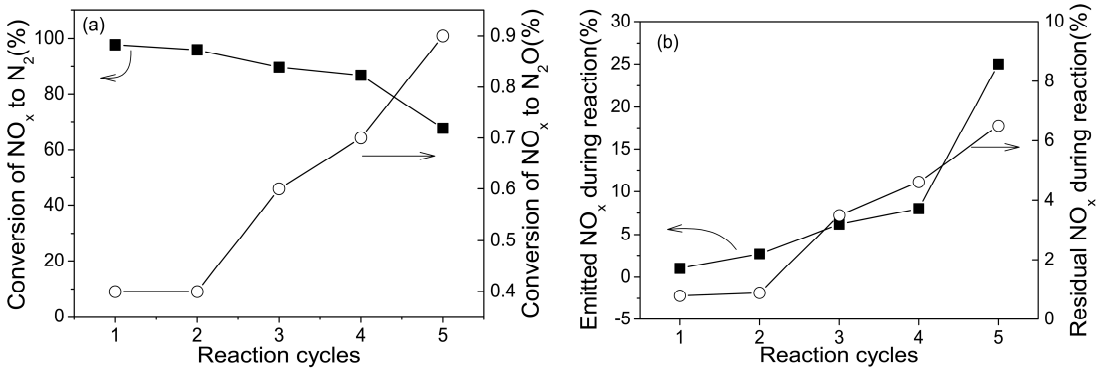

Figure S6. Cyclic operation of AC/H-ZSM-5 for the removal of NO_x (a) conversion of adsorbed NO_x (b) percentage of emitted NO_x during reaction and residual NO_x after reaction.

Conditions: in the adsorption stage, 0.645 mmol NO_x adsorbed; in the discharge stage, 50 mL/min flow rate of N_2, discharge power is 3.6 W, input energy of each cycle is 0.832W·h; between the intermission of two cycles, the AC/H-ZSM-5 should be treated in N_2 at 300 ^oC for 30 min, as without the procedure the conversion of NO_x is similar to that on bare H-ZSM-5. Notably, the percentage of NO_x remained on the catalyst after reaction is determined by the desorbed NO_x during the pretreatment process, as most adsorbed NO_x was desorbed in the temperature range (No other N-containing products were produced during the pretreatment process).