

Supporting Information

- Activation energies

We carried out the photo-SCR at lower contact time (catalyst amounts: 16 mg) to evaluate the initial rates. The selectivity to N₂ was 100% at all the temperatures. Arrhenius plot (Ln r v.s. 1/T) of the initial rates is shown in [Figure S1](#). The NO conversion denoted the same tendency of [Figure 2](#). In the low (353 K–433 K) and high (493 K–593 K) temperature range, the logarithm of N₂ formation rate shows a good linear relation to the inverse number of the reaction temperature. In these two temperature ranges, we fit the logarithm of N₂ formation rate with straight lines and expressed them as following equation:

$$\ln r = 6.08 - 1.08 \times 10^3 / T \quad (353 \text{ K} - 433 \text{ K}) \quad (1)$$

$$\ln r = 2.98 + 3.26 \times 10^2 / T \quad (493 \text{ K} - 593 \text{ K}) \quad (2)$$

where, r is the N₂ formation rate (nmol s⁻¹) and T is the absolute reaction temperature (K). Using the slope of these equations, the activation energies were estimated to be 9.0 kJ mol⁻¹ (353 K–433 K) and -2.7 kJ mol⁻¹ (493 K–593 K).

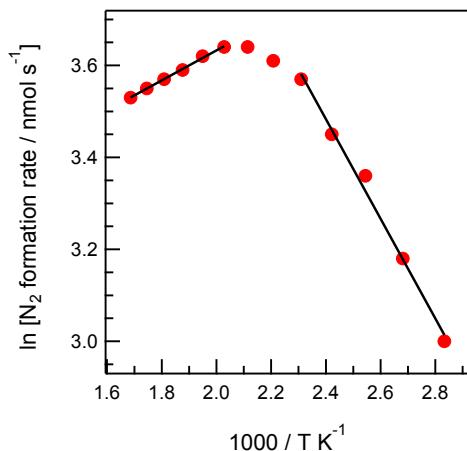


Figure S1. Arrhenius plots of the photo-SCR. (catalyst amount: 16 mg, NO: 1000 ppm, NH₃: 1000 ppm, O₂ 2 %, GHSV: 100,000 h⁻¹)