

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).

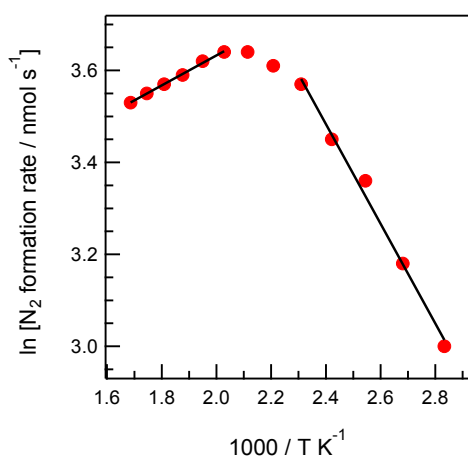


Figure S1. Arrhenius plots of the photo-SCR. (catalyst amount: 16 mg, NO: 1000 ppm, NH₃: 1000 ppm, O₂ 2 %, GHSV: 100,000 h⁻¹)