**Supplementary Information**

TABLE SI. Quantitative analysis of the H2-TPR profiles for Mn-based/ATP catalysts.

|  |  |  |  |
| --- | --- | --- | --- |
| Catalysts | Peak α (A) | Peak β (A) | Total (A) |
| MnFeTiO*x*/ATP | 19.19 | 2.47 | 21.66 |
| MnFeO*x*/ATP | 4.89 | 7.54 | 12.43 |
| MnTiO*x*/ATP | 7.32 | 1.09 | 8.41 |
| MnCrO*x*/ATP | 7.75 | 4.56 | 12.31 |

TABLE SII. XPS results of various catalysts.

|  |  |  |
| --- | --- | --- |
| Catalysts | Surface atomic concentration (%) | Relative atomic ratio (%) |
|  | Mn | Fe | O | Ti | Mn4+/Mn | Fe3+/Fe2+ | Oα/O |
| MnFeO*x*/ATP | 5.42 | 7.44 | 72.97 | - | 22.5 | 2.09 | 70.21 |
| MnFeTiO*x*/ATP | 7.30 | 4.88 | 73.01 | 3.03 | 34.8 | 2.58 | 78.87 |

TABLE SIII. Quantitative analysis of NH3-TPD over MnFeTiO*x*/ATP and K-MnFeTiO*x*/ATP.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Catalysts | Peak α (A) | Peak β (A) | Peak γ (A) | Peak ε (A) |
| MnFeTiO*x*/ATP | 564.4 | 1040.5 | 2469.8 | 596.6 |
| K-MnFeTiO*x*/ATP | 342.3 | 489.4 | 1343.2 | 381.17 |



FIG. S1. Stability of NO reduction over the catalysts in the presence of SO2 at 300 ºC.



FIG. S2. Stability test of the catalysts within 10 h at 300 °C.