Electronic Supplementary Material (ESI) for Journal of Materials Chemistry A.

Supporting Information

Oxygen Storage Capacity of $Sr_3Fe_2O_{7-\delta}$ Having High Structural Stability

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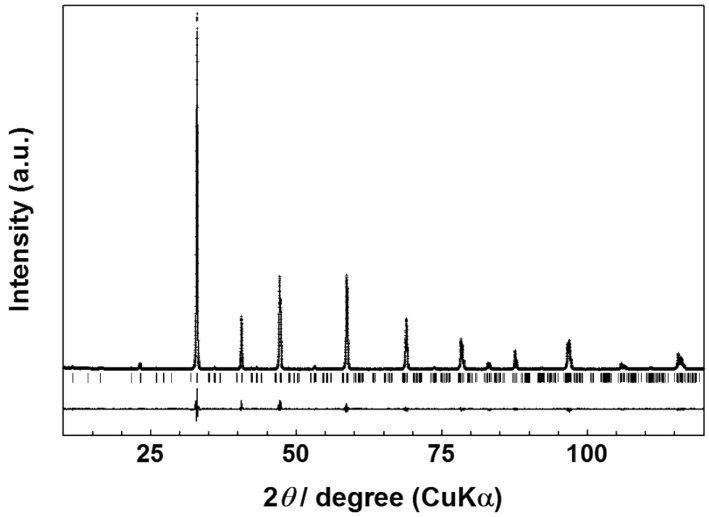

Fig. S1. Result of Rietveld analysis of $SrFeO_{3-x}$: $SrFeO_{3-x}$ adopts the *I*4/*mmm* space group, *a* = 10.934 Å, c = 7.702 Å, Sr1 on 8*i* (0.258, 0, 0), Sr2 on 8*j* (0.252, 0, 0), Fe1 on 4*e* (0, 0, 0.254), Fe2 on 8*f* (0.25, 0.25, 0.25) ,Fe3 on 4*d* (0.5, 0, 0.25), O1 on 2*b* (0, 0, 0.5), O2 on 16*m* (0.120, 0.120, 0.223), O3 on 8*h* (0.240, 0.240, 0.5) ,O4 on 16*k* (0.124, 0.624, 0.25) and O5 on 4*c* (0.5, 0, 0) with 100% occupancy(Sr1, Sr2, Fe1, Fe2, Fe3, O1, O2,O3, O4) and 86% occupancy (O5), R_{wp} = 10.3 %, S = 1.1.

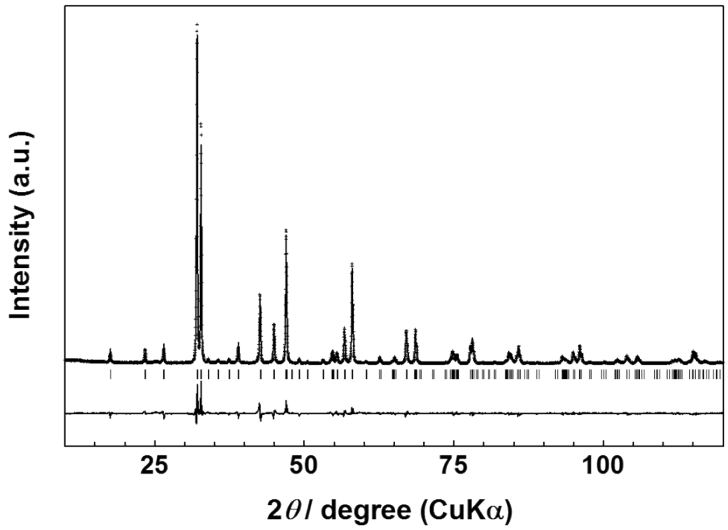

Fig. S2. Result of Rietveld analysis of $Sr_3Fe_2O_{7-y}$: $Sr_3Fe_2O_{7-y}$ adopts the *I*4*/mmm* space group, *a* = 3.865 Å, *c* = 20.157 Å, Sr1 on 2*b* (0, 0, 0.5), Sr2 on 4*e* (0, 0, 0.317), Fe on 4*e* (0, 0, 0.098), O1 on 8*g* (0, 0.5, 0.095), O2 on 4*e* (0, 0.5, 0.194) and O3 on 2*a* (0, 0, 0) with 100% occupancy (Sr1, Sr2, Fe, O1, O2) and 75% occupancy (O3), R_{wp} = 11.9%, S = 1.5.

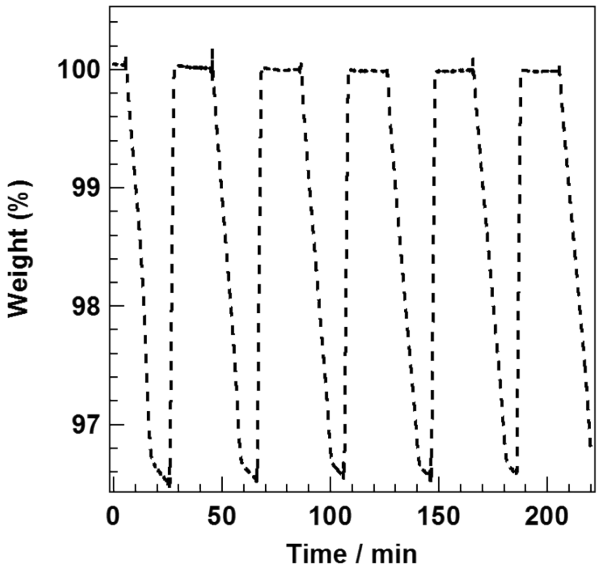

Fig. S3. OSC profile of α-Fe_2O_3 itself at 773 K.

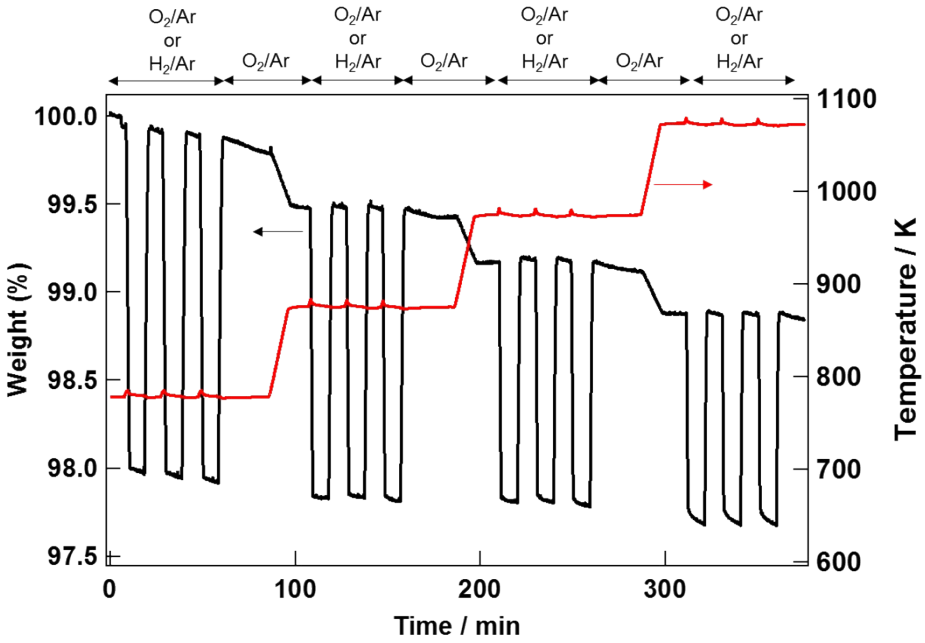

Fig. S4. OSC profile of $Sr_3Fe_2O_{7-y}$ at various temperatures.

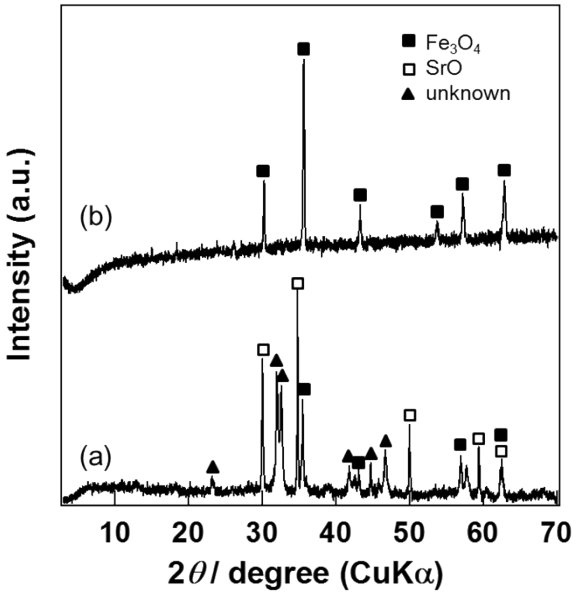

Fig. S5. XRD patterns of the products obtained by the reduction at 773 K of the physically mixed sample (a) and α-Fe_2O_3 itself (b).

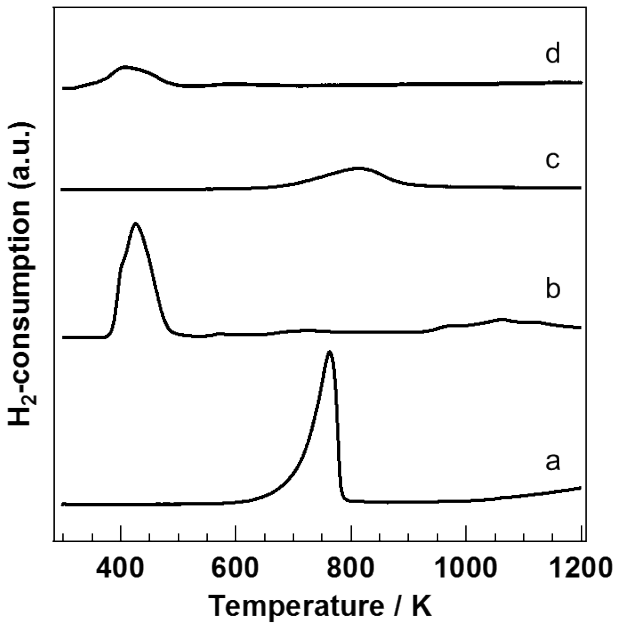

Fig. S6. TPR profiles of $Sr_3Fe_2O_{7-y}$ (a), Pt/$Sr_3Fe_2O_{7-y}$ (b), $Ce_2Zr_2O_8$ (c), and Pt/$Ce_2Zr_2O_8$ (d).

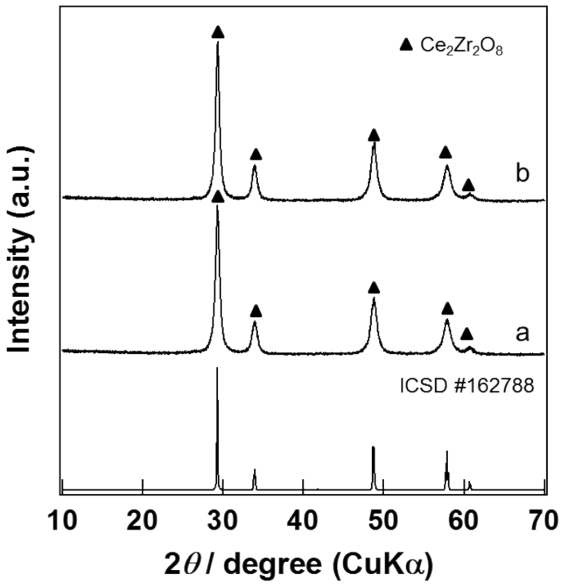

Fig. S7. XRD patterns of $Ce_2Zr_2O_8$ (a) and Pt/$Ce_2Zr_2O_8$ (b).