Supporting Information

Engineering and modeling the effect of Mg doping in TiO_2 for enhanced photocatalytic reduction of CO_2 to fuels

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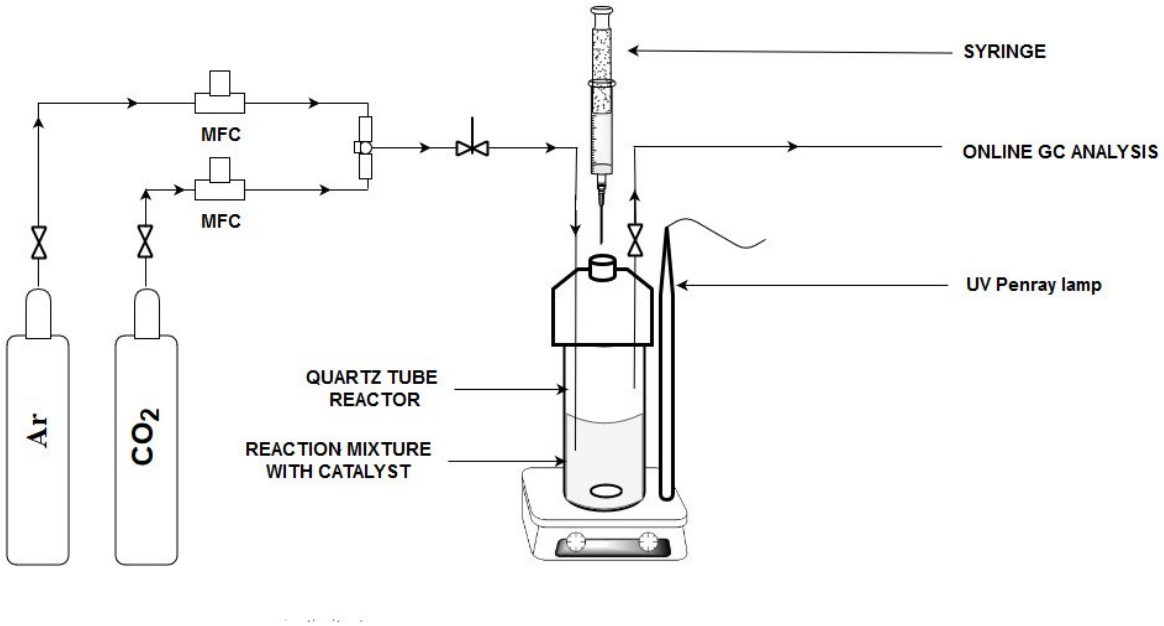

Fig. S1. Schematic diagram of the experimental setup used for the photocatalytic activity using H_2O as the reductant.

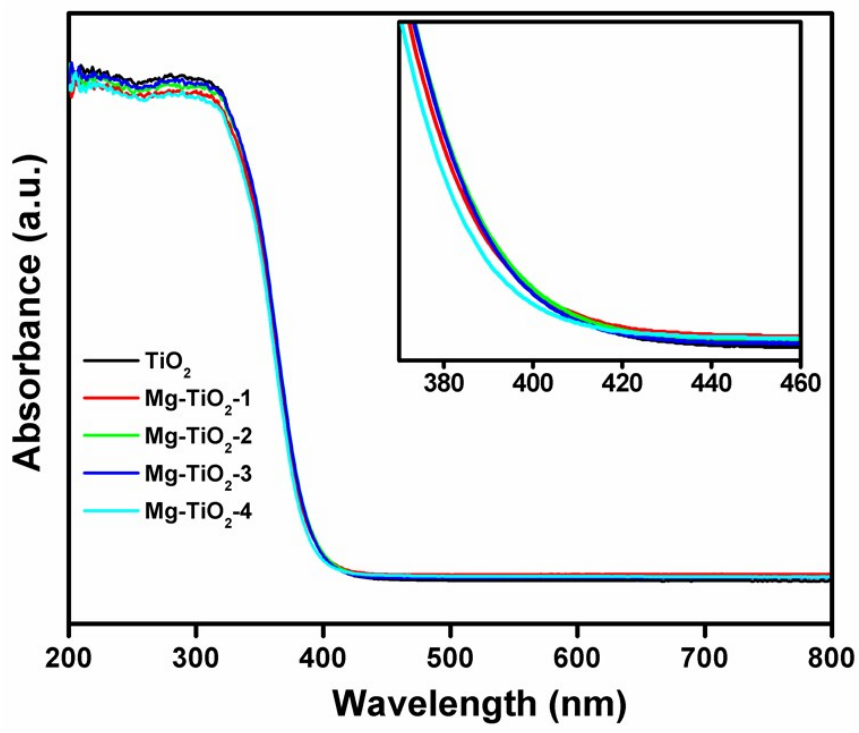

Fig. S2. UV–Vis absorbance spectra of all the prepared samples including 1% Mg-TiO_2, which was code-named Mg-TiO_2-4.

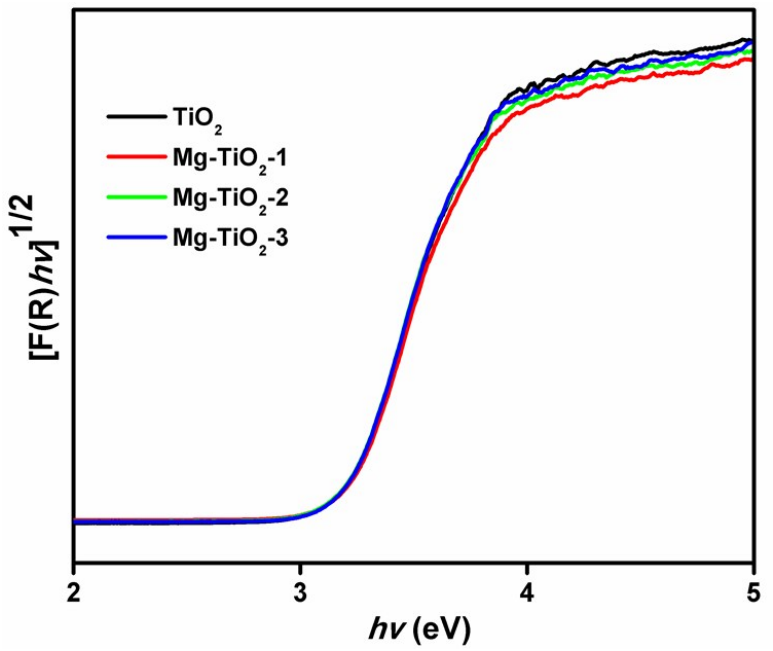

Fig. S3 Tauc plot of TiO_2, Mg-TiO_2-1, Mg-TiO_2-2 and Mg-TiO_2-3.

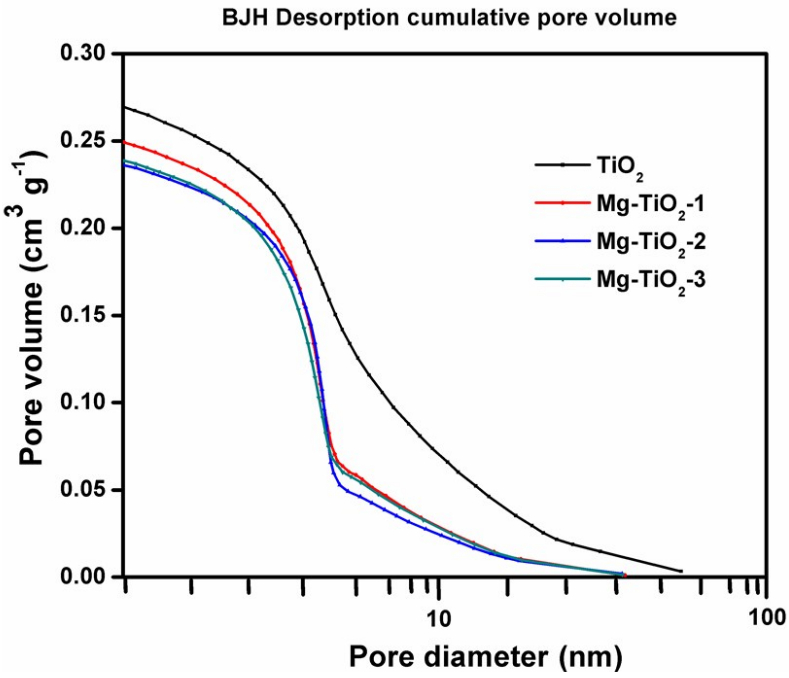

Fig. S4 Cumulative pore volume of TiO_2, Mg-TiO_2-1, Mg-TiO_2-2 and Mg-TiO_2-3.

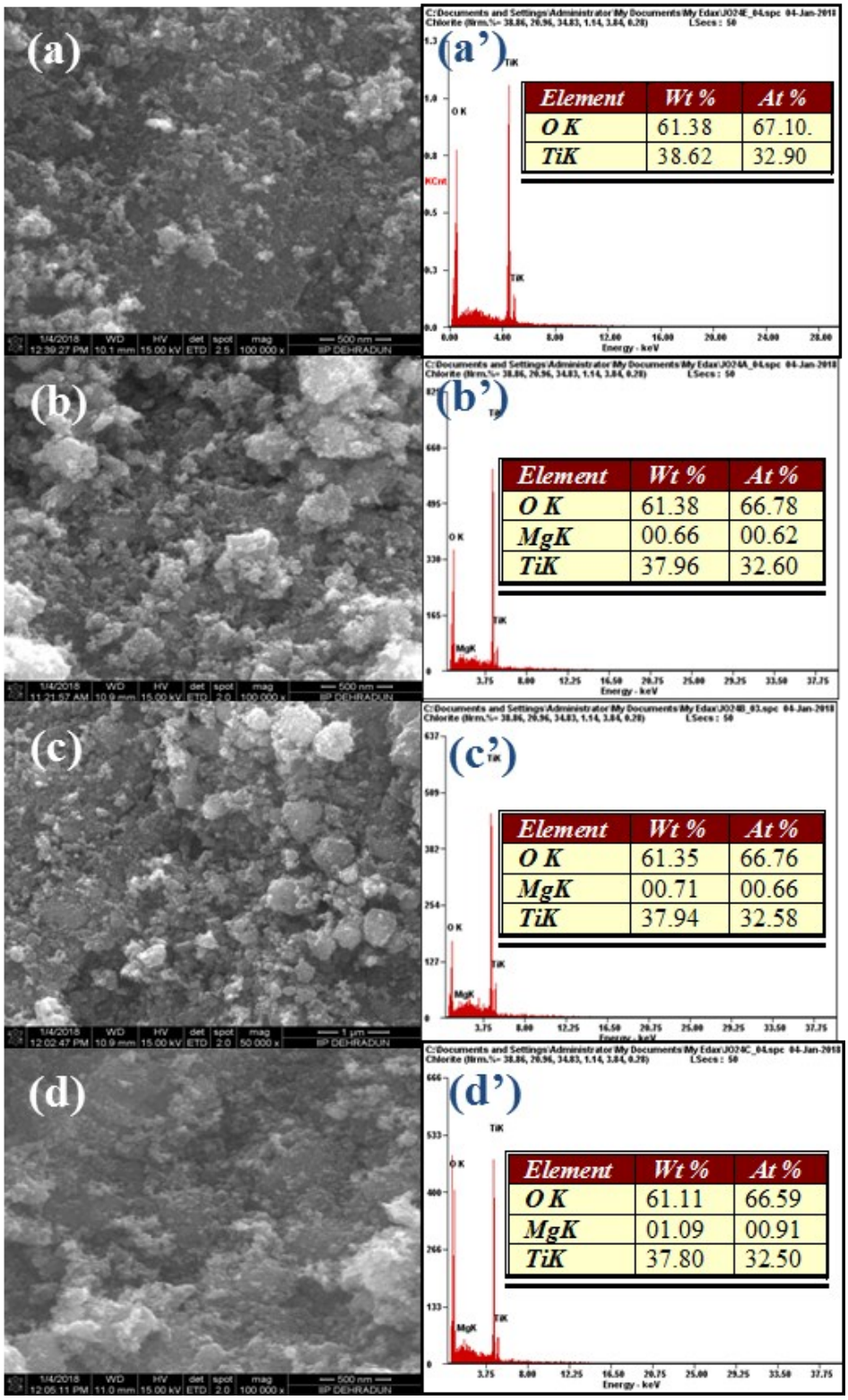

Fig. S5 SEM images and EDX of (a, a') TiO_2, (b, b') Mg-TiO_2-1, (c, c') Mg-TiO_2-2 and (d, d') Mg-TiO_2-3 respectively.

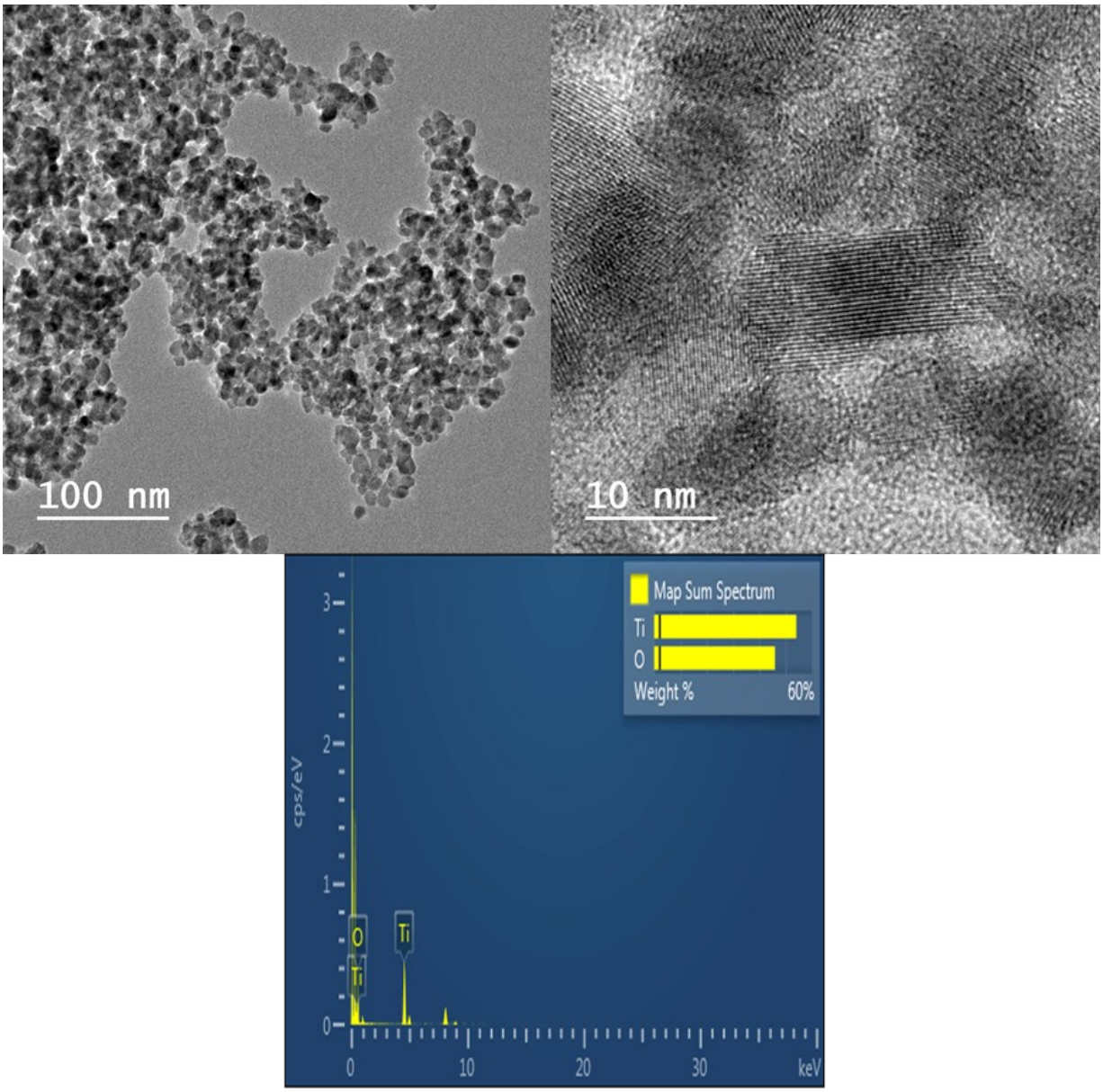

Fig. S6 TEM, HRTEM images and EDX of TiO_2.

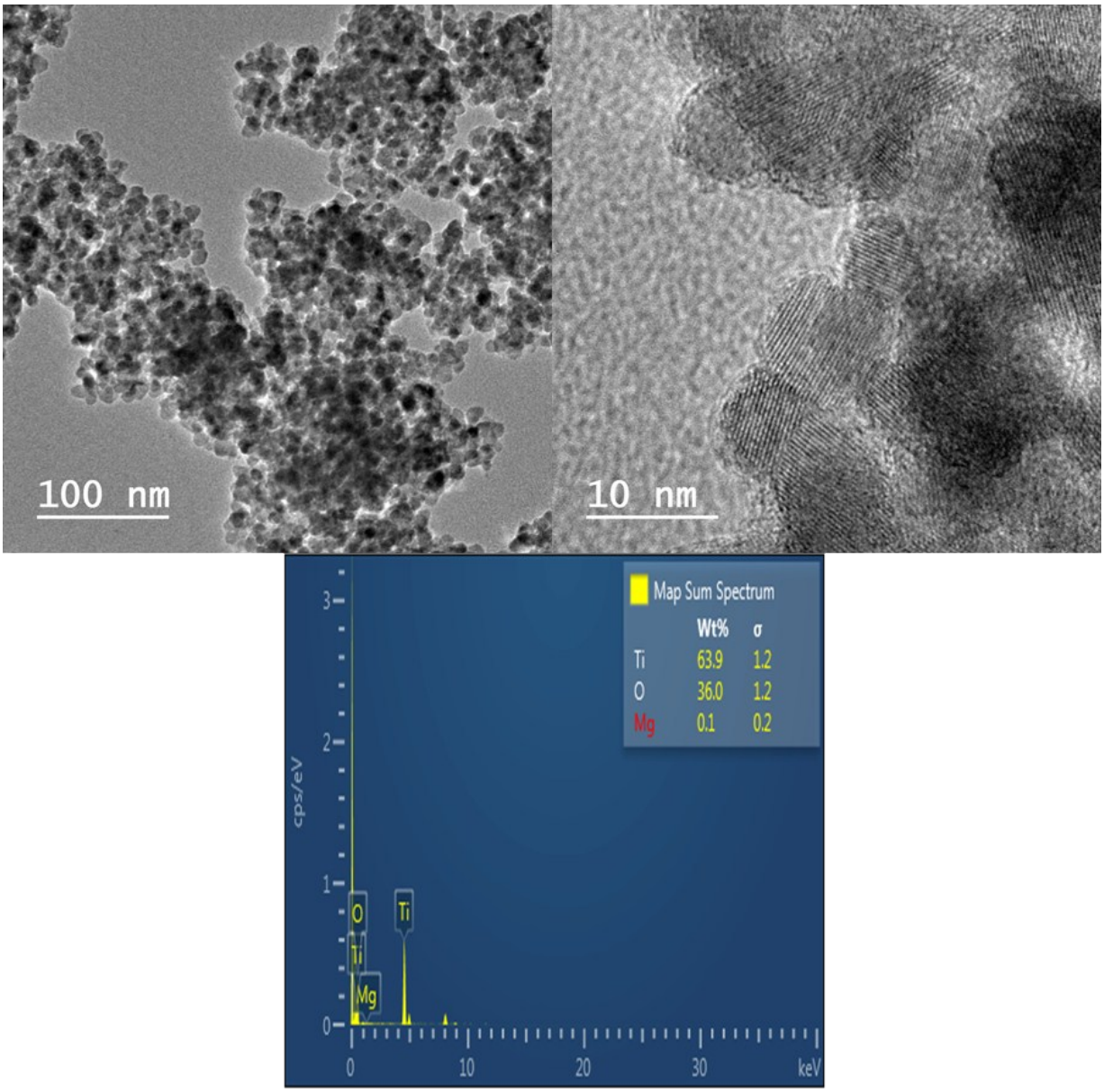

Fig. S7 TEM, HRTEM images and EDX of Mg-TiO_2-1.

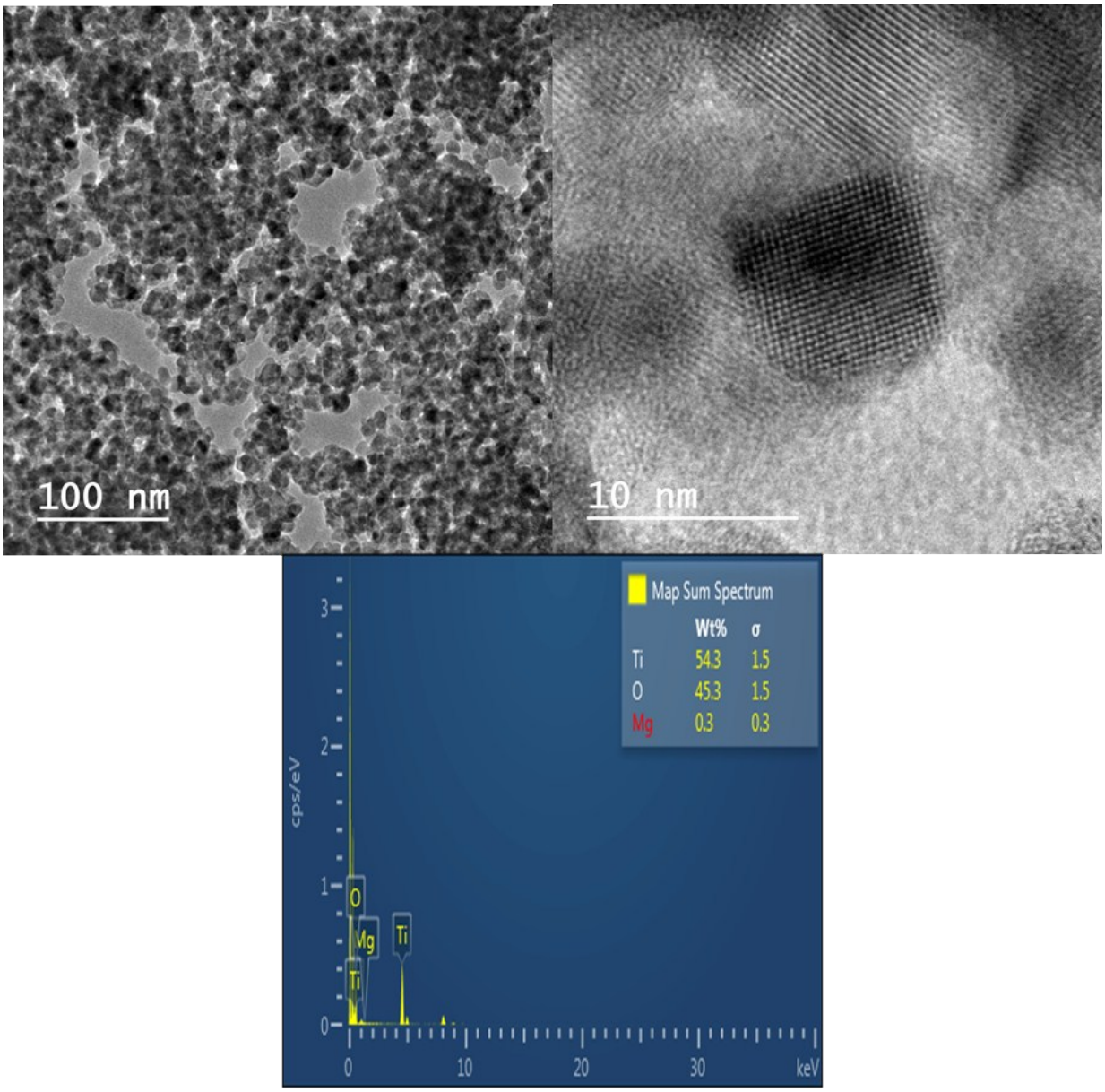

Fig. S8 TEM, HRTEM images and EDX of Mg-TiO_2-2

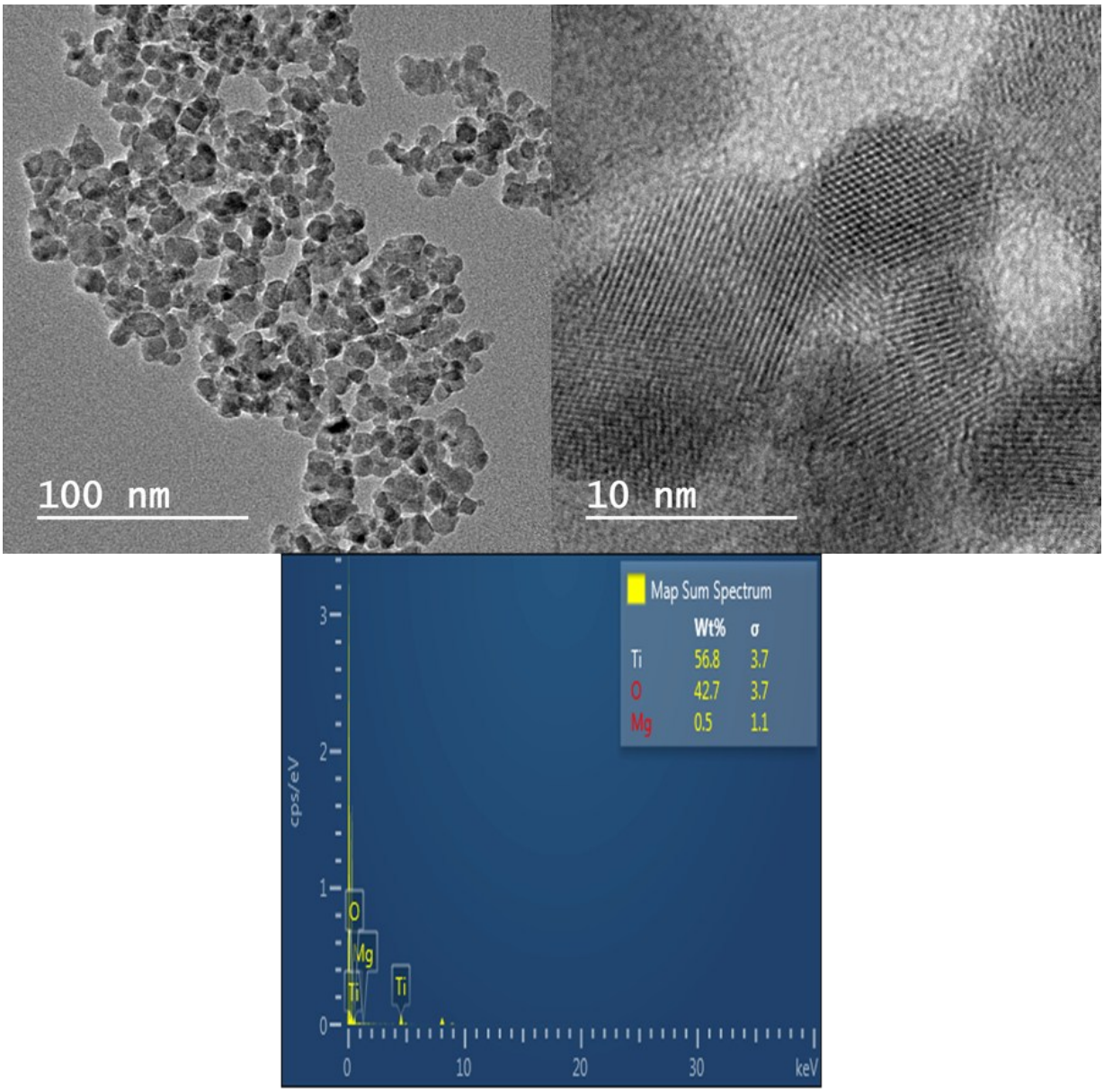

Fig. S9 TEM, HRTEM images and EDX of Mg-TiO_2-3

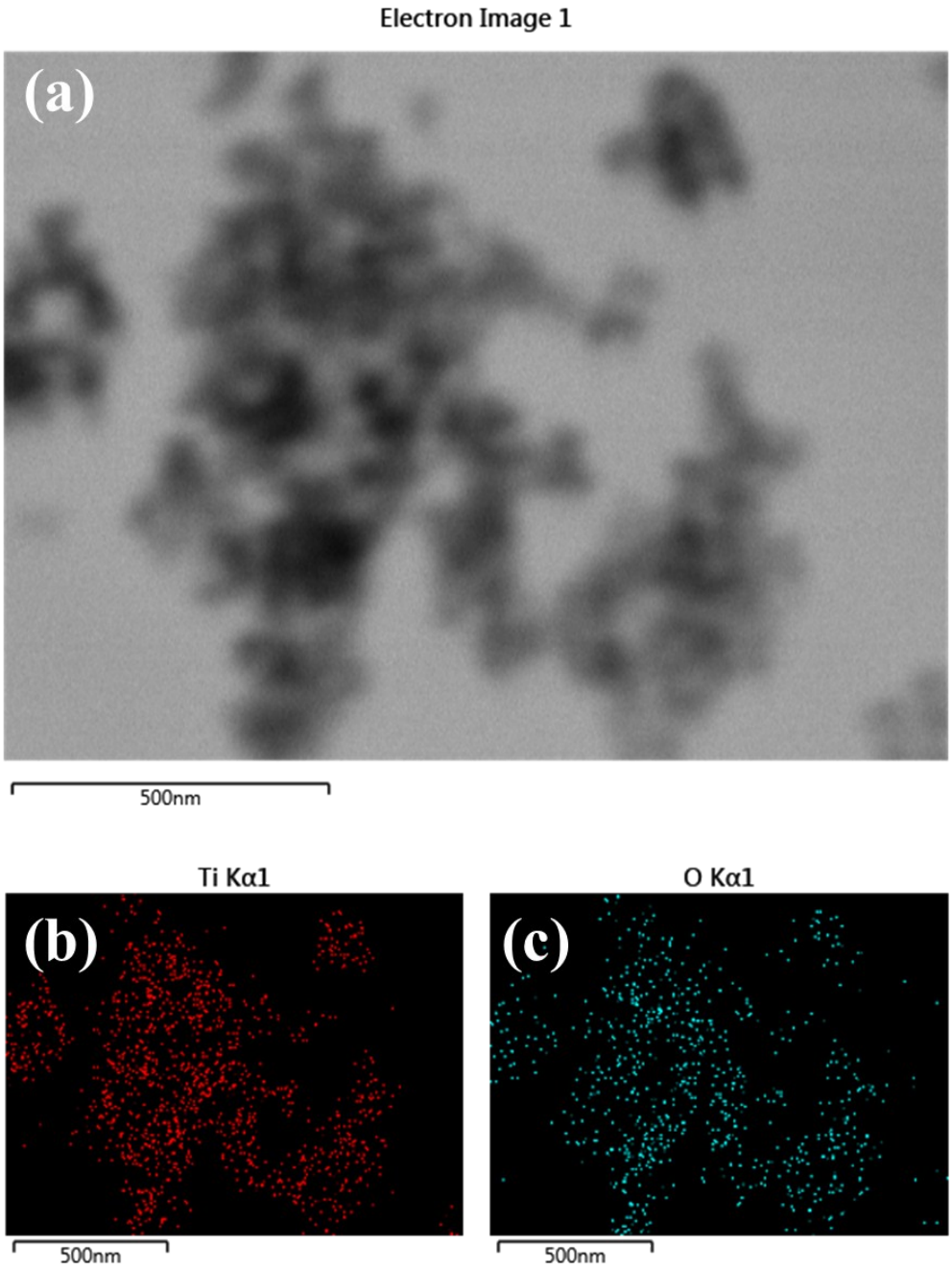

Fig. S10 Elemental mapping of TiO_2

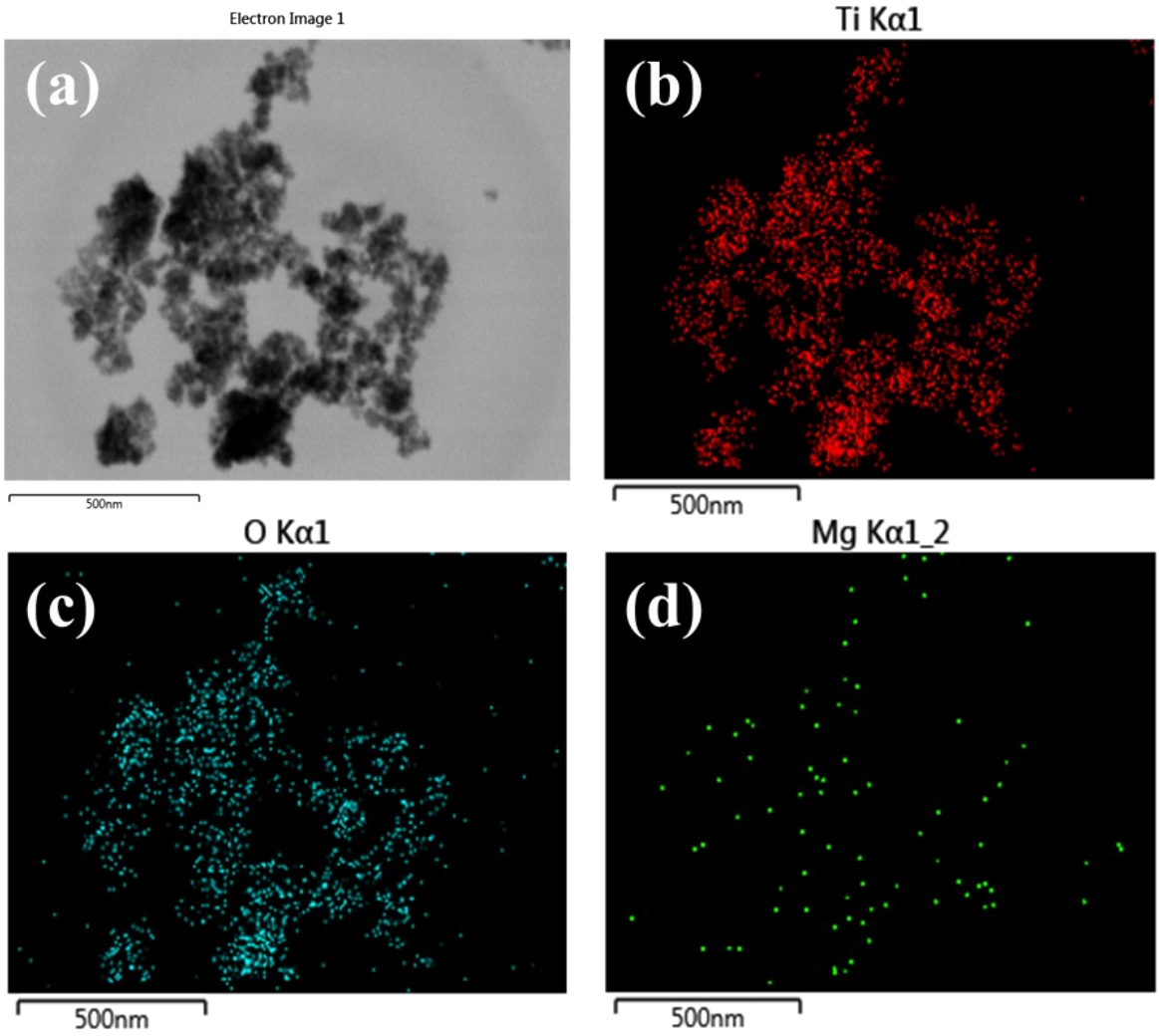

Fig. S11 Elemental mapping of Mg-TiO_2-1

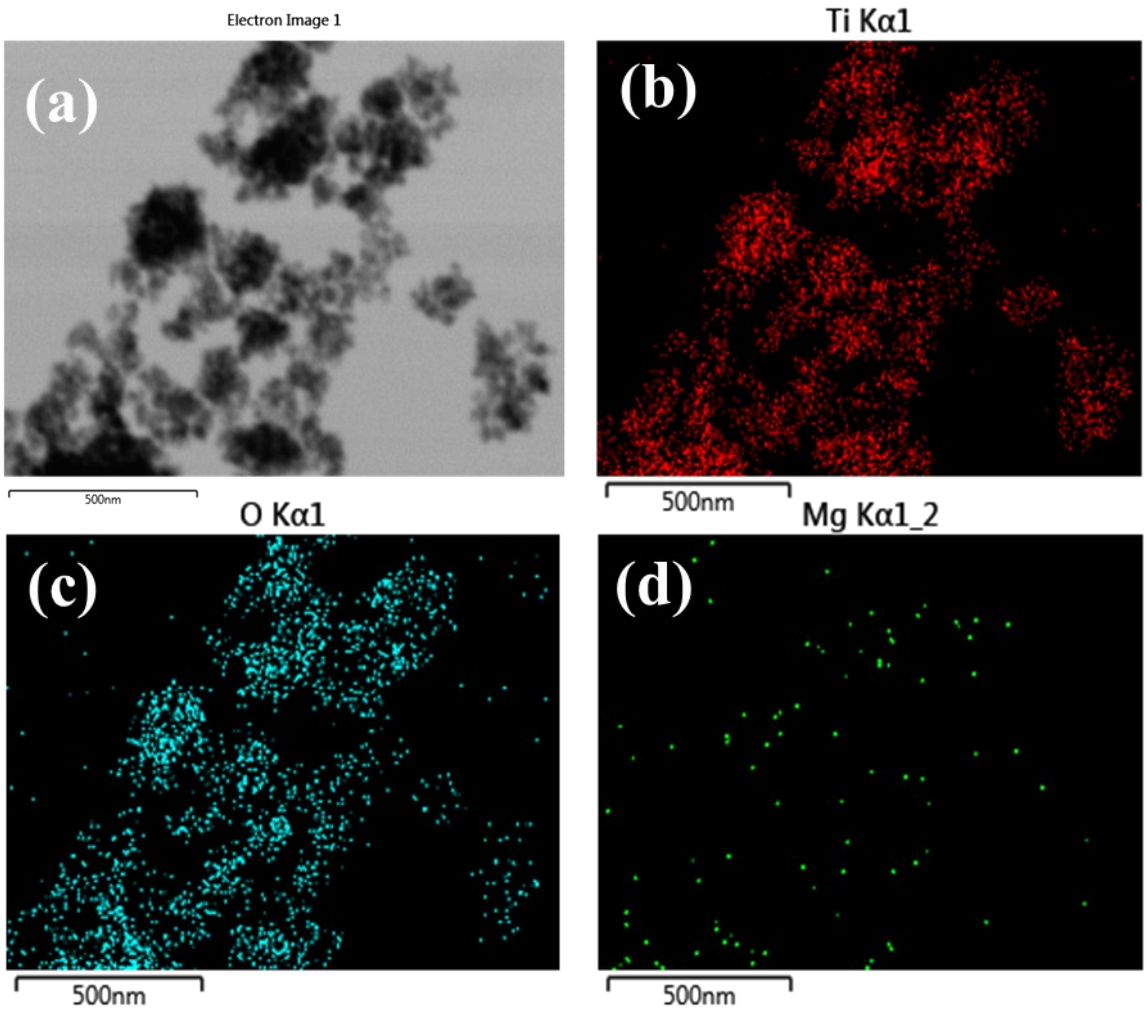

Fig. S12 Elemental mapping of Mg-TiO_2-2

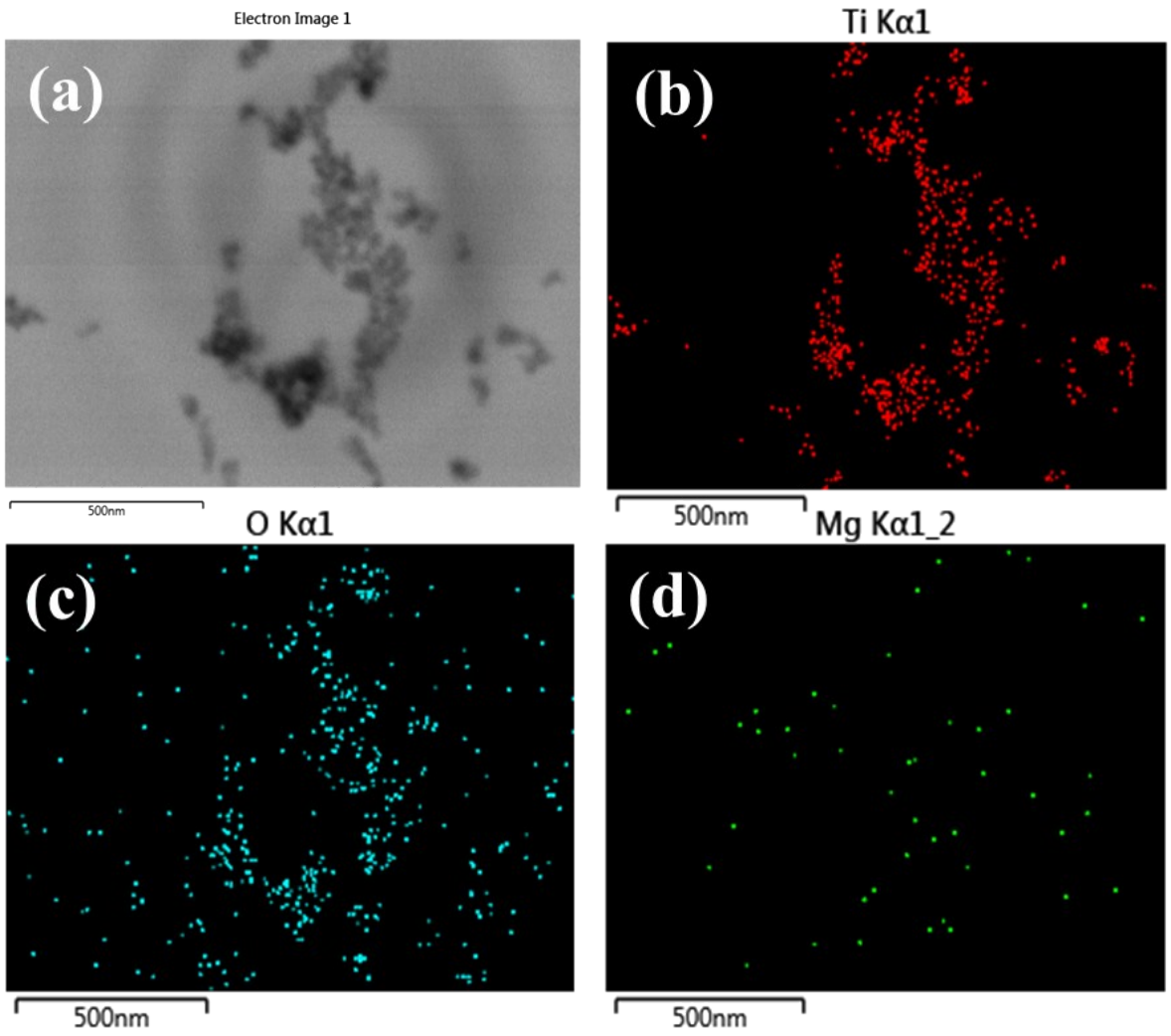

Fig. S13 Elemental mapping of Mg-TiO_2-3

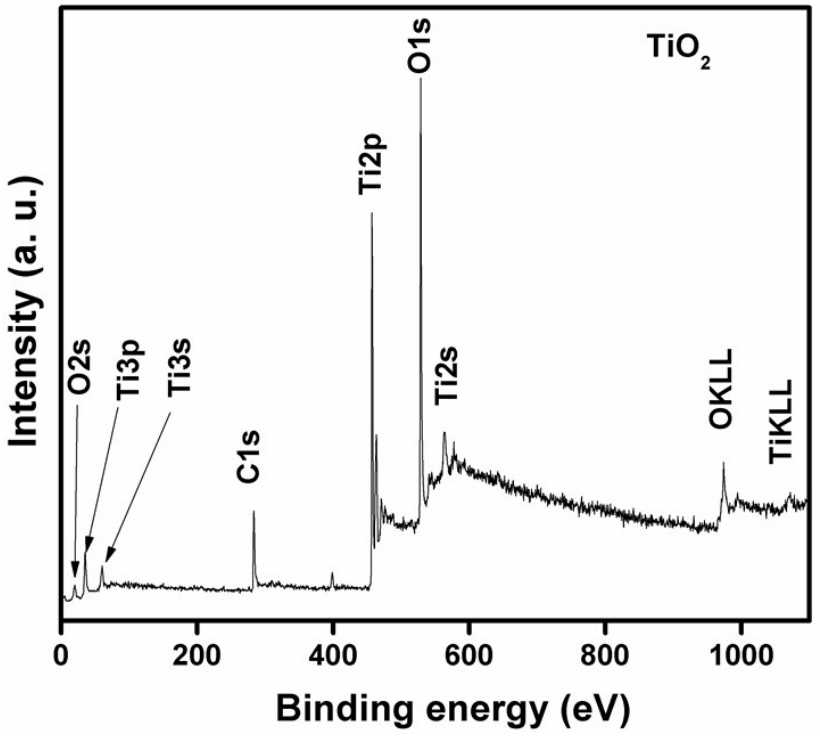

Fig. S14 XPS survey spectrum of TiO_2.

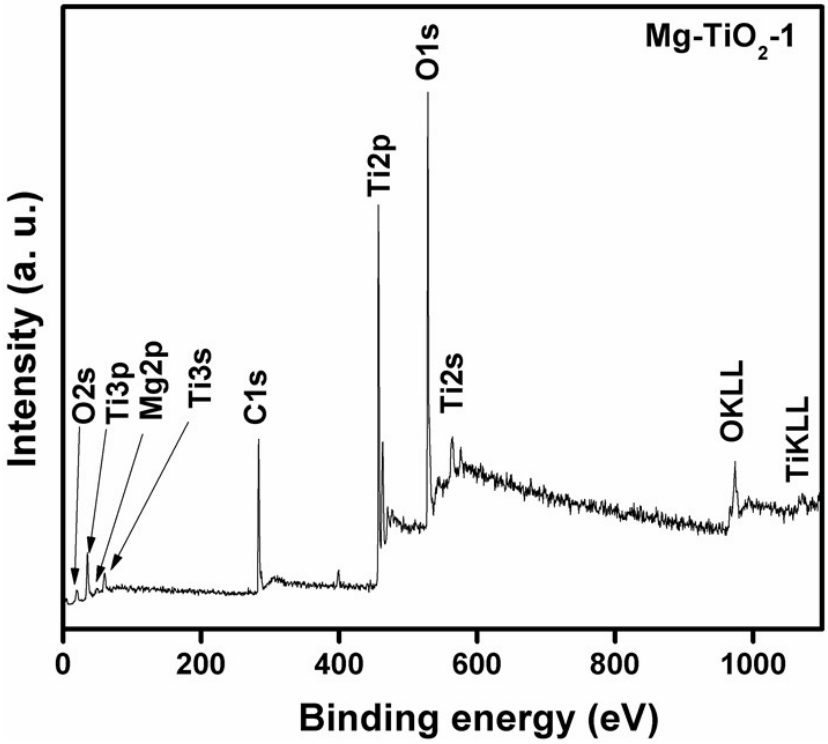

Fig. S15 XPS survey spectrum of Mg-TiO_2-1

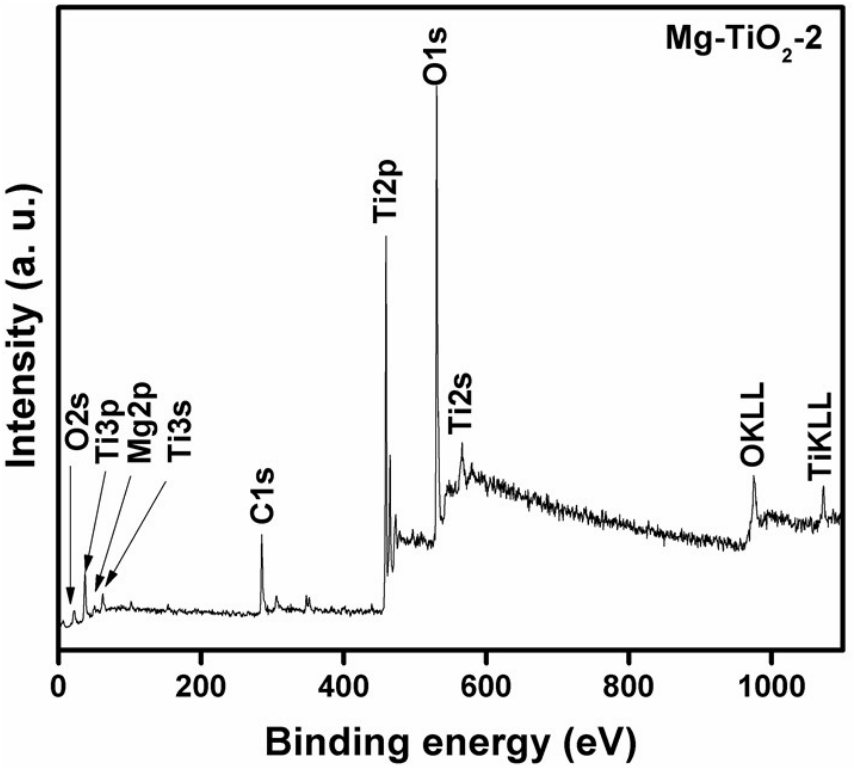

Fig. S16 XPS survey spectrum of Mg-TiO_2-2

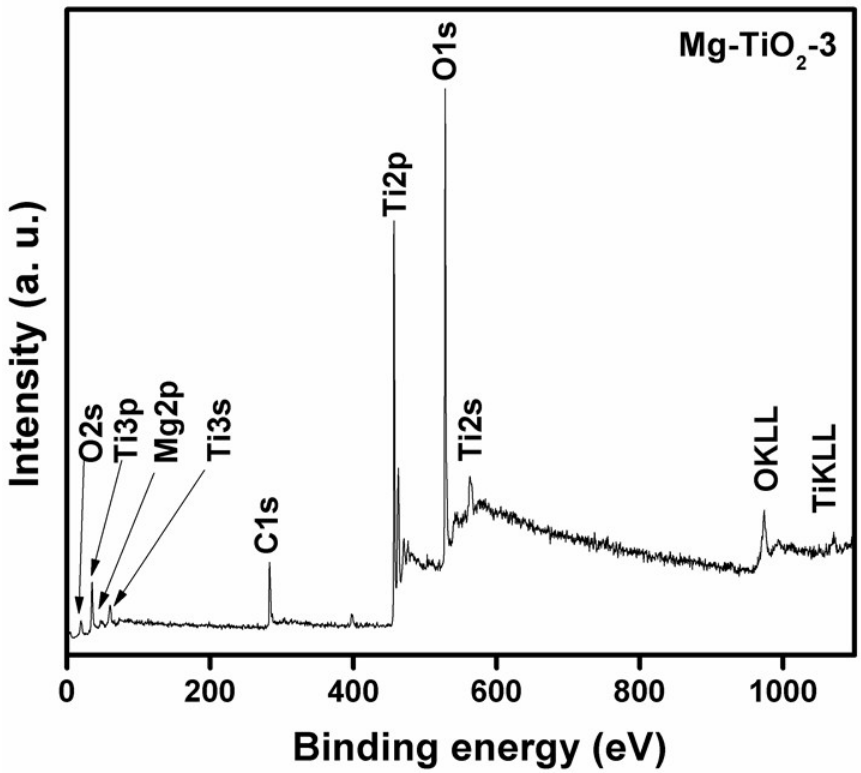

Fig. S17 XPS survey spectrum of Mg-TiO_2-3

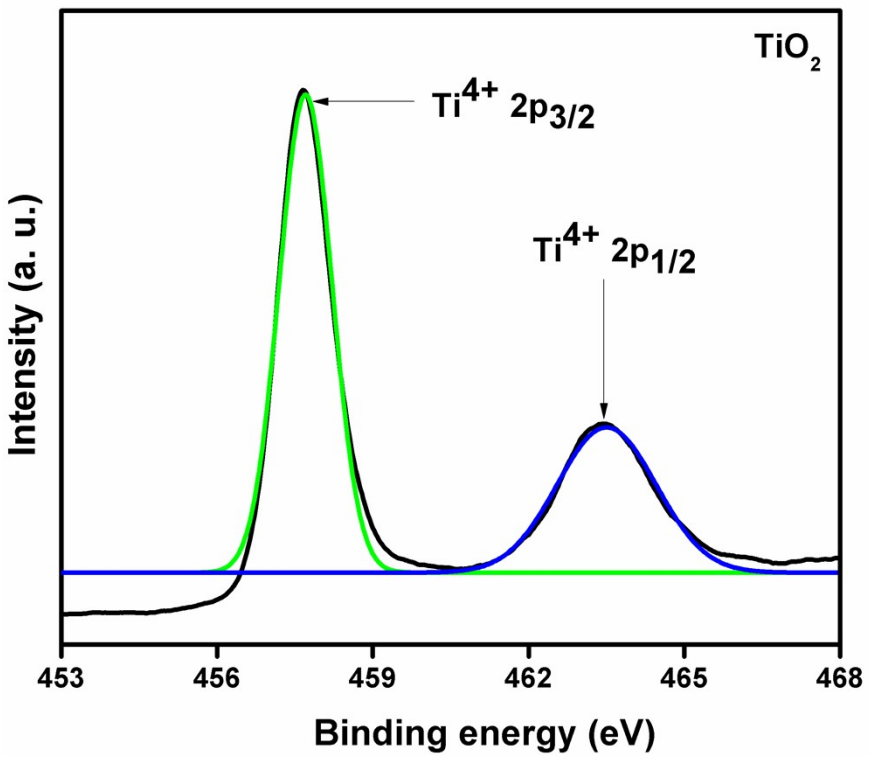

Fig. S18 XPS survey spectrum of Ti 2p of TiO_2

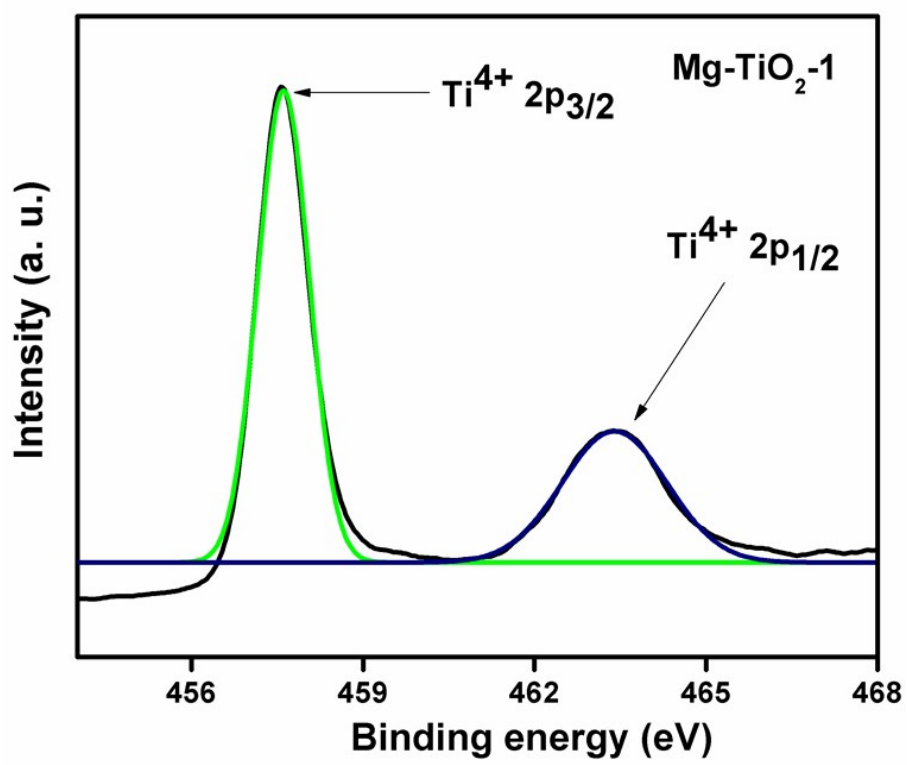

Fig. S19 XPS survey spectrum of Ti 2p of Mg-TiO_2-1

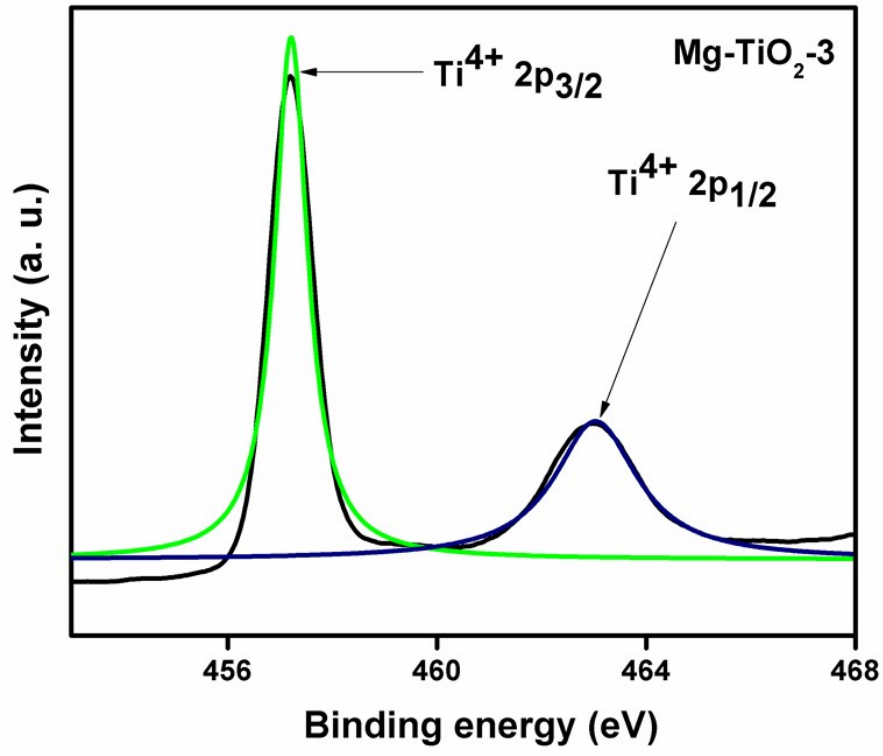

Fig. S20 XPS survey spectrum of Ti 2p of Mg-TiO_2-3

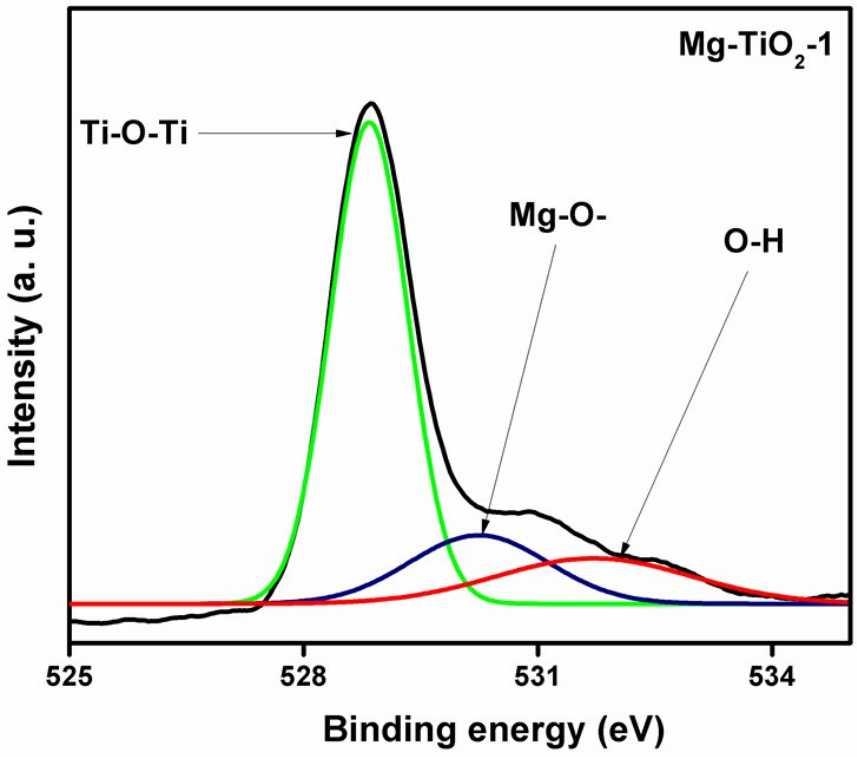

Fig. S21 XPS survey spectrum of O 1s of Mg-TiO_2-1

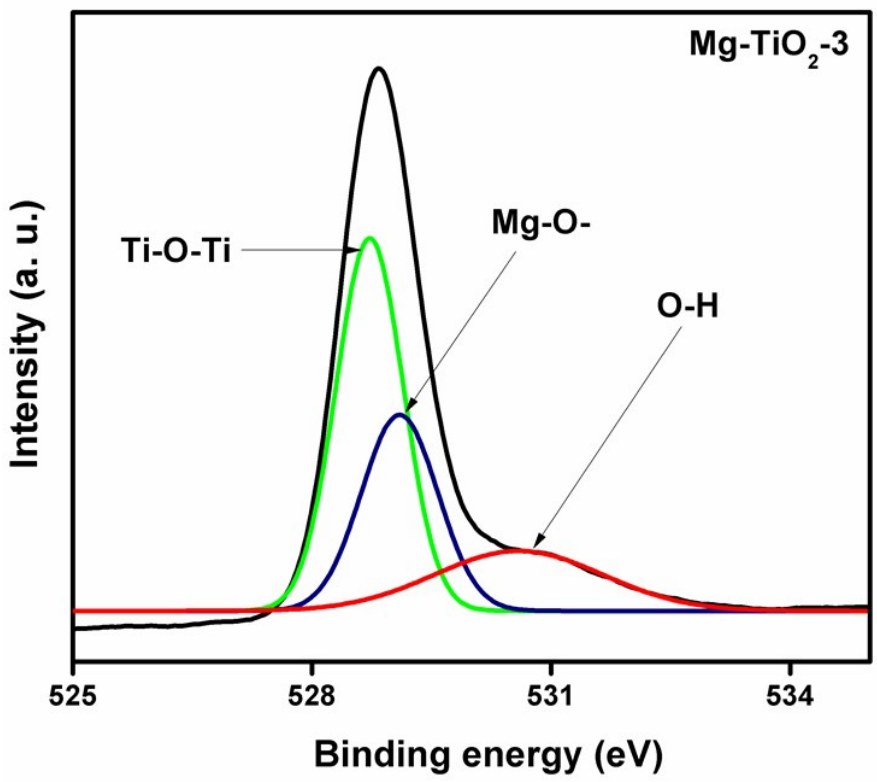

Fig. S22 XPS survey spectrum of O 1s of Mg-TiO_2-3

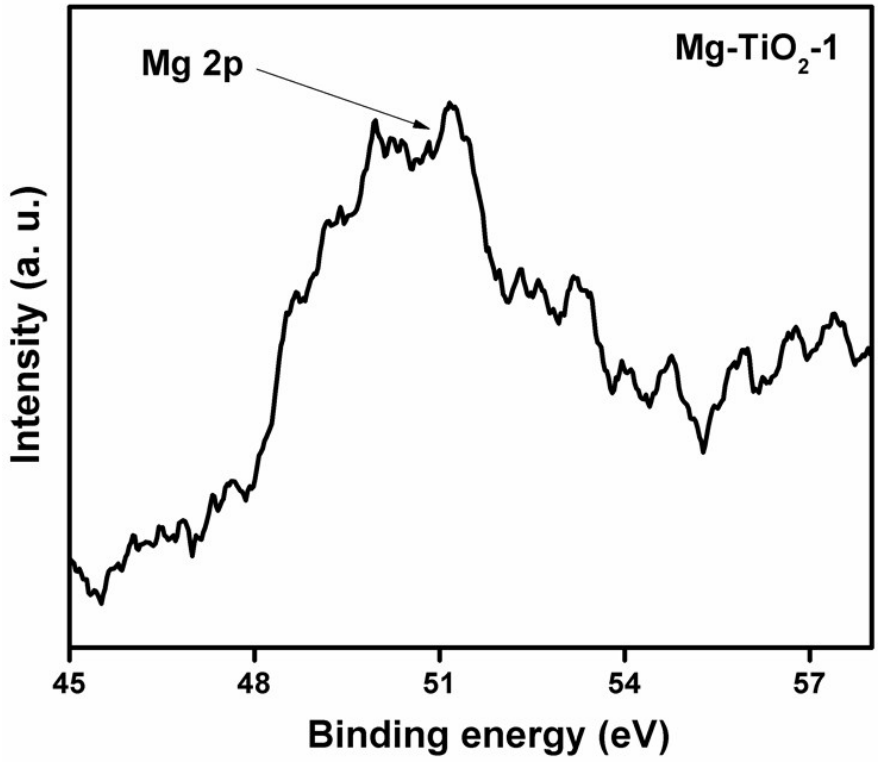

Fig. S23 XPS survey spectrum of Mg 2p of Mg-TiO_2-1

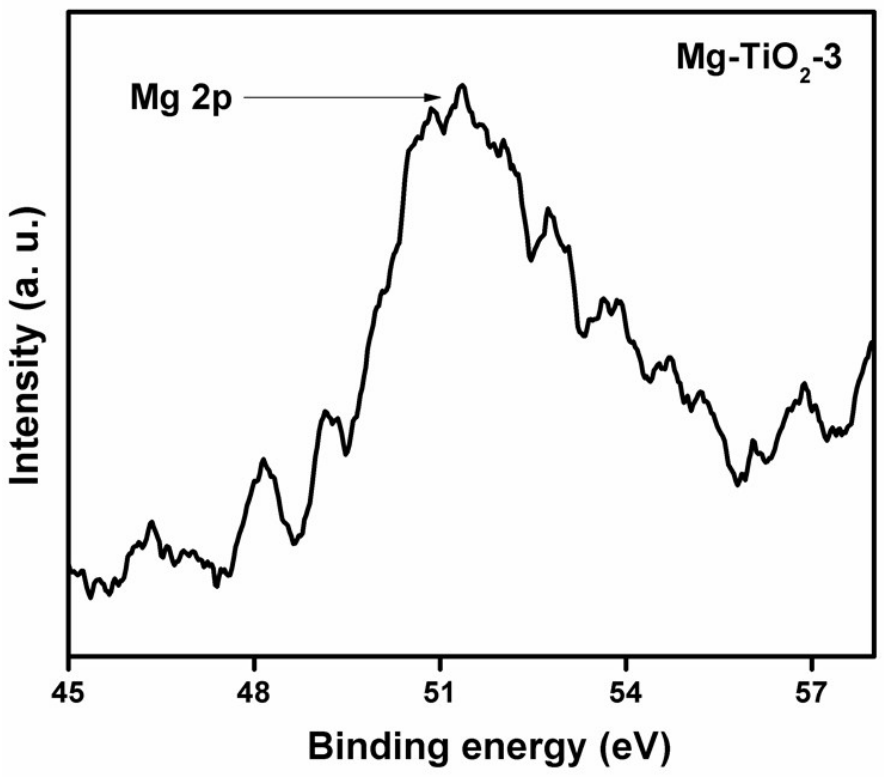

Fig. S24 XPS survey spectrum of Mg 2p of Mg-TiO_2-3