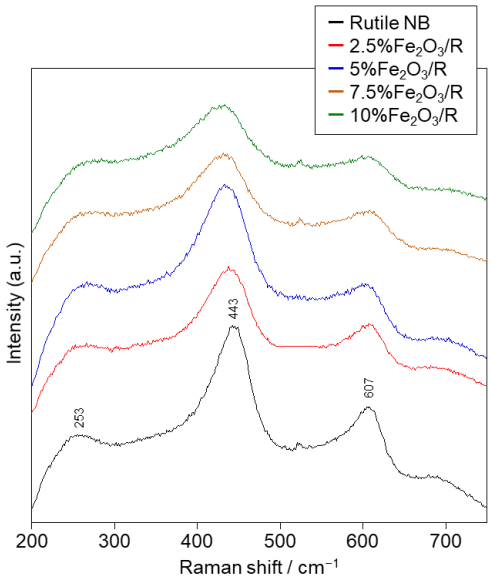

Fig. S1. Raman spectra of different materials. Rutile NB has three bands at 253, 443 and 607 cm^{-1}, which are typically observed for rutile TiO_2. The band at 443 cm^{-1}, assignable to the E_g vibrational mode, broadens and blue-shifts with the increase of the embedded amount of α-Fe_2O_3. This might be attributed to the variationof the stoichiometry of TiO_2 (*e.g.*, oxygen deficiency, Ti-O-Fe).

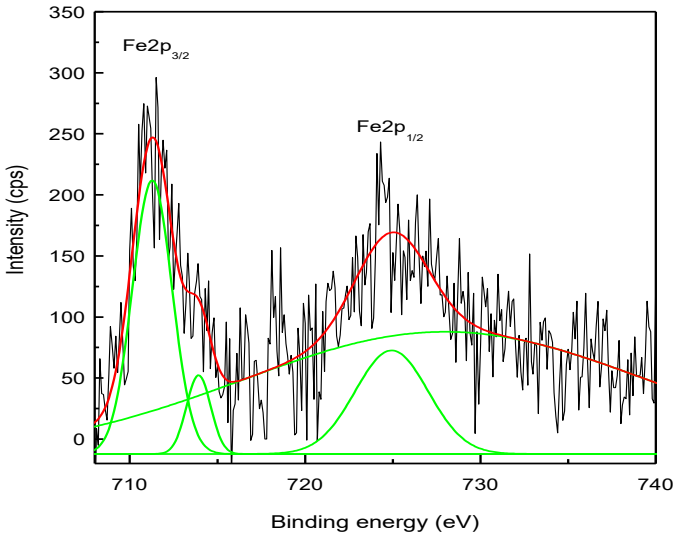

Fig. S2. XPS spectrum of Fe 2p for 5%Fe_2O_3/R sample. Peaks at 711.1 eV and 724.8 eV are ascribed to 3+ oxidation states of iron. The peak centered around 715 eV is identified as the surface peak of α-Fe_2O_3 (Ref. 31-33 in the main text).