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

Visible light photocatalysis by metal-to-metal charge transfer for degradation of methyl orange

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Supplementary Information

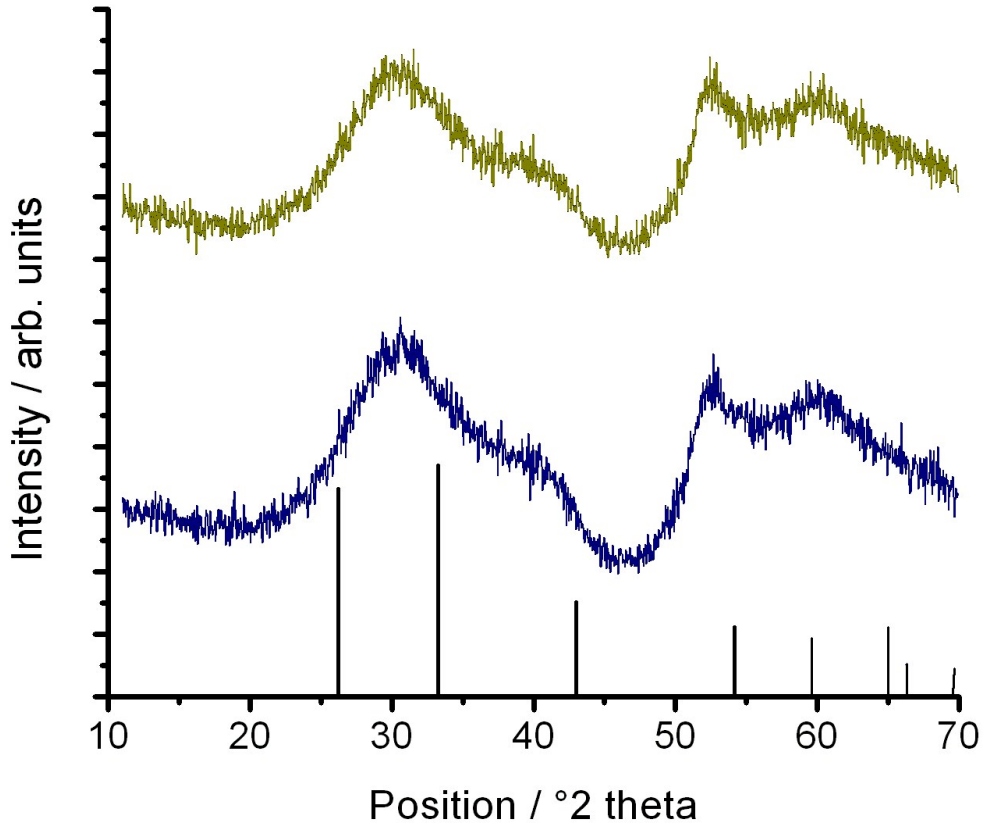

Figure S1: X-ray diffraction patterns of 3%CrO_x-Nb_2O_5 (dark yellow) and Nb_2O_5 (navy), with the peak positions for the pseudo-hexagonal phase of Nb_2O_5 (JCPDS 28-317) indicated.

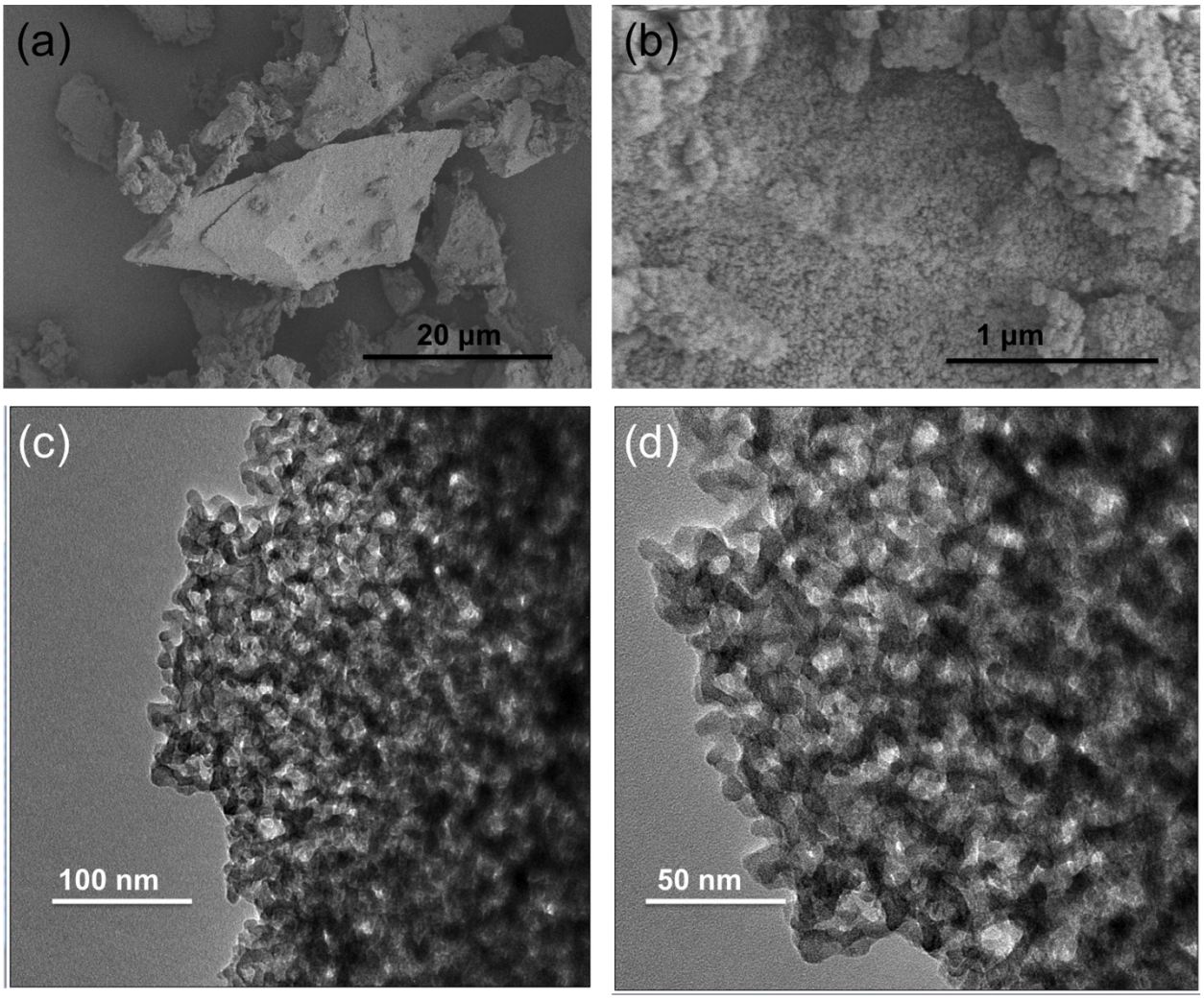

Figure S2: SEM (a,b) and TEM (c,d) images of Nb_2O_5

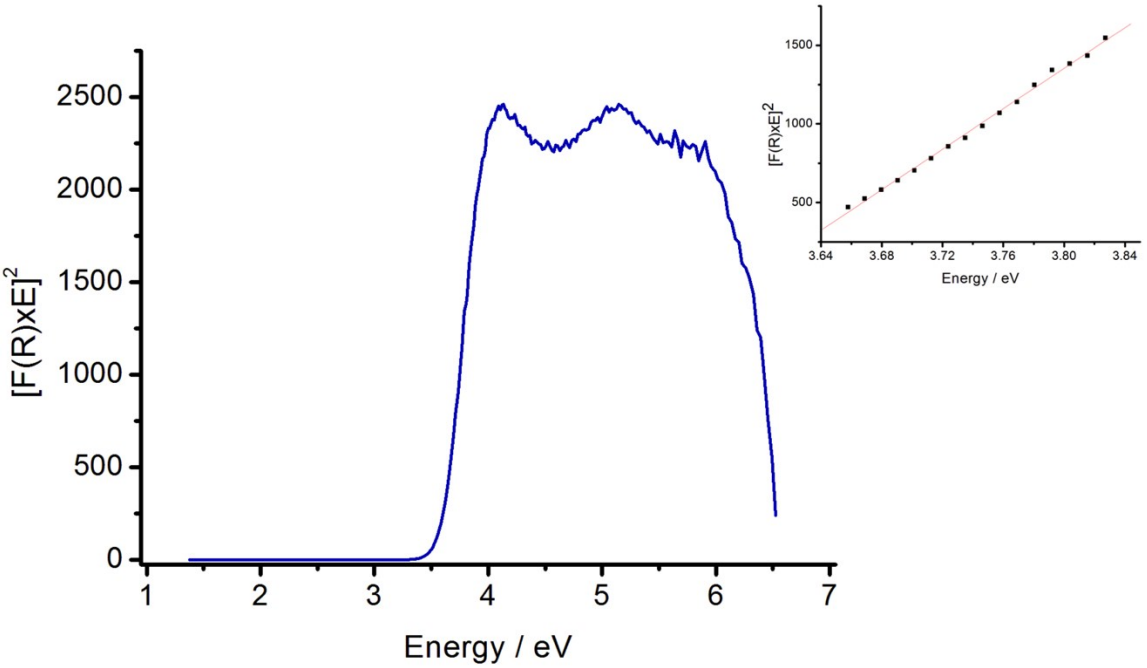

Figure S3: Direct band gap plot for Nb_2O_5 starting material; Insert: extrapolation of the linear section of the diffuse reflectance of the Nb_2O_5 plot plotted to determine the direct band gap.

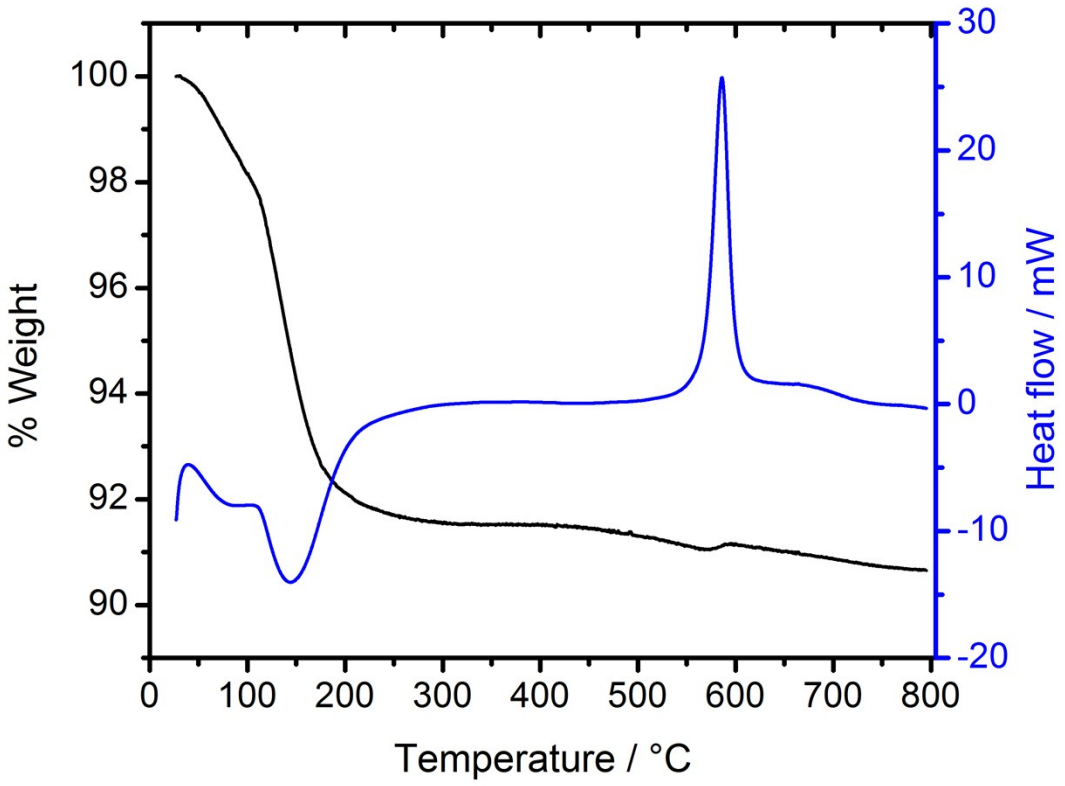

Figure S4: TGA data for 3%$Cr(NO_3)_3$-Nb_2O_5, showing the weight loss and the heat flow difference. Heat rate 5°C min^{-1} in air atmosphere.

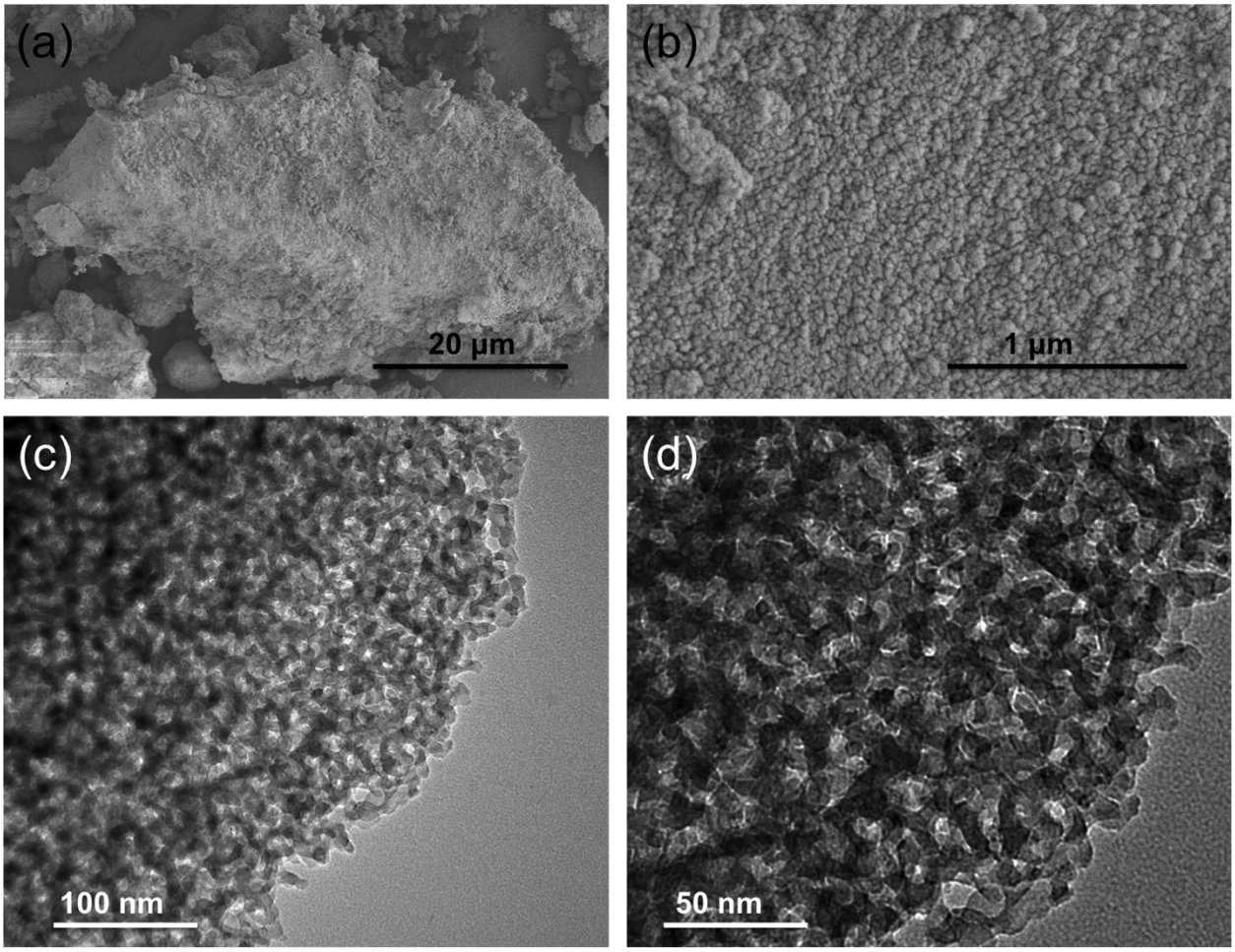

Figure S5: SEM (a,b) and TEM (c,d) images of 5%Cr_2O_3-Nb_2O_5

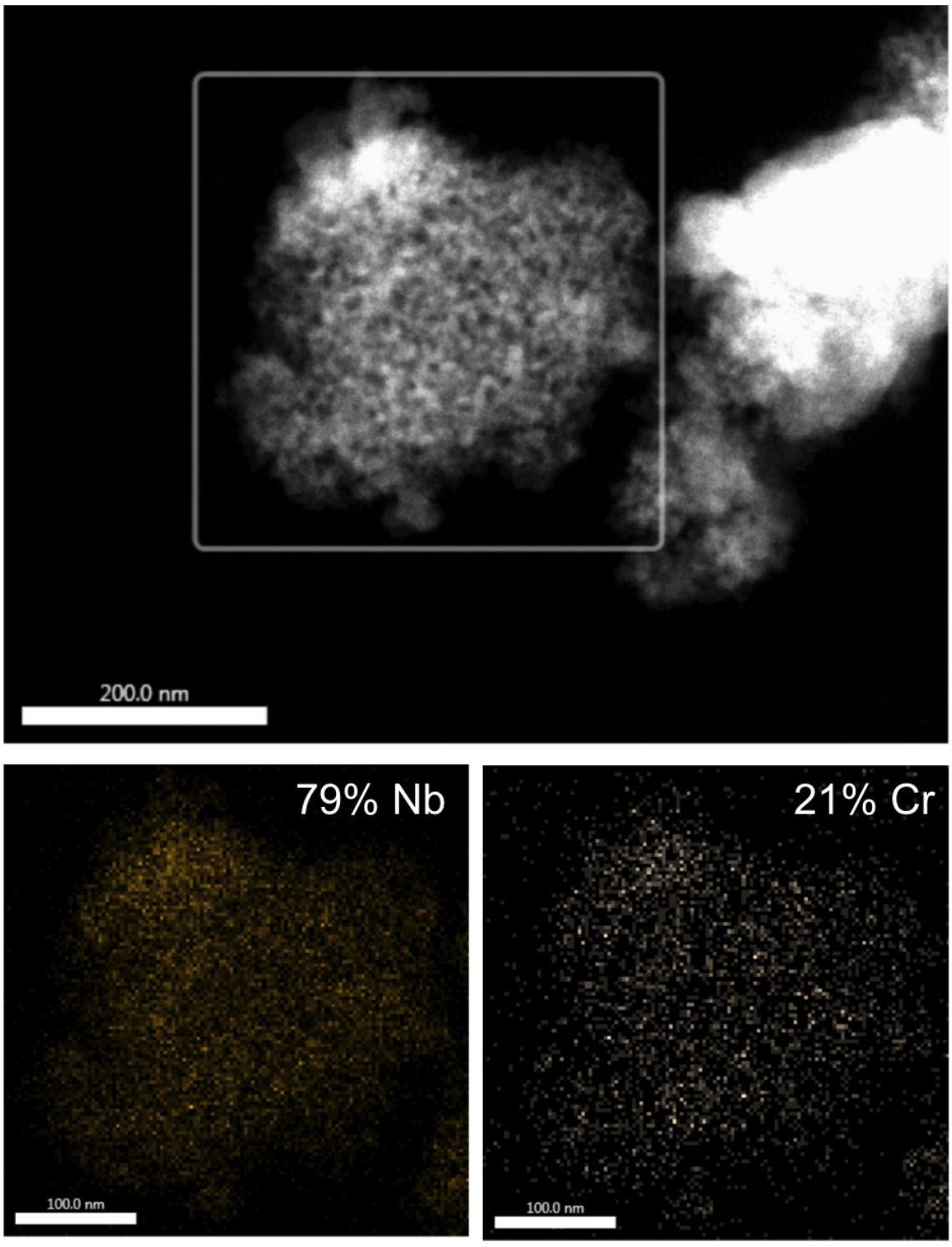

Figure S6: Elemental mapping of 5%Cr_2O_3-Nb_2O_5

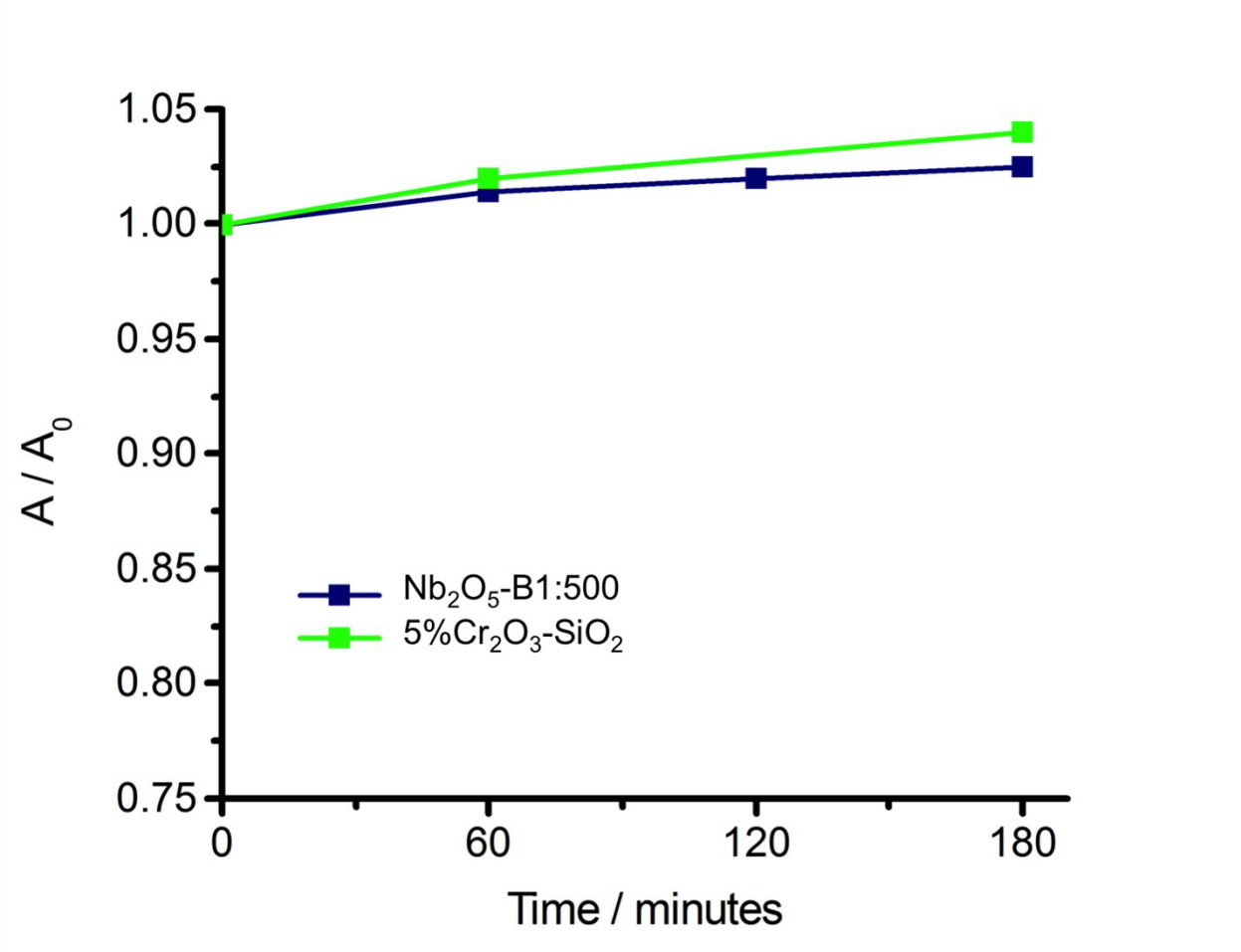

Figure S7: The change in concentration of the red form of methyl orange over the course of a visible light reaction with Nb_2O_5 and 5%Cr_2O_3-SiO_2.

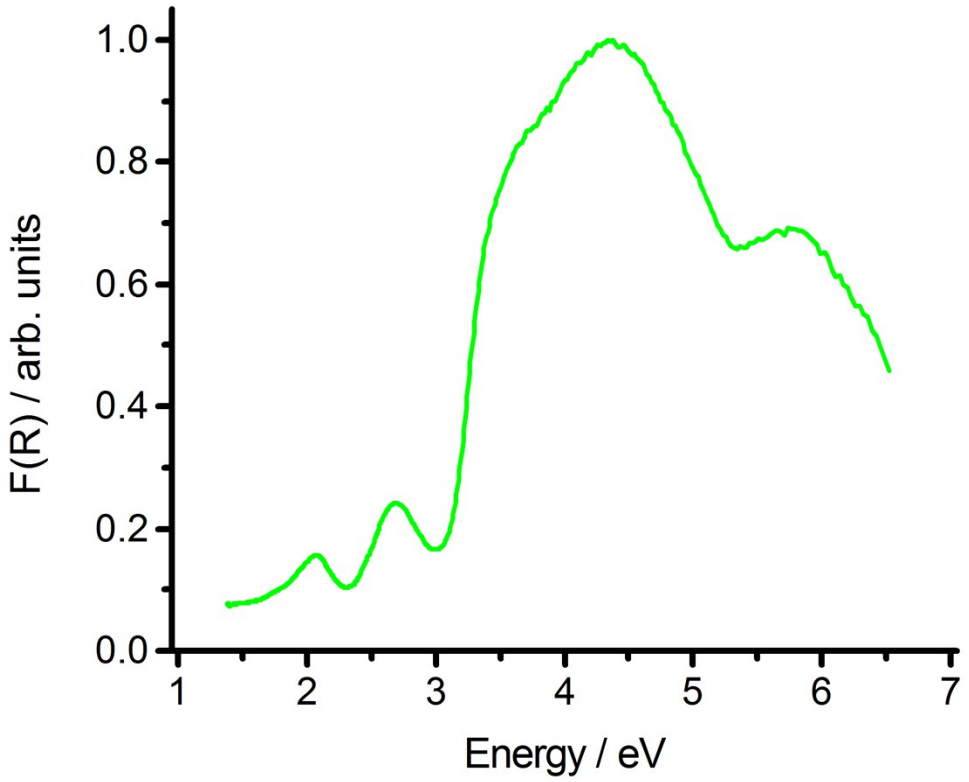

Figure S8: The diffuse reflectance spectrum of 5%Cr_2O_3-SiO_2.

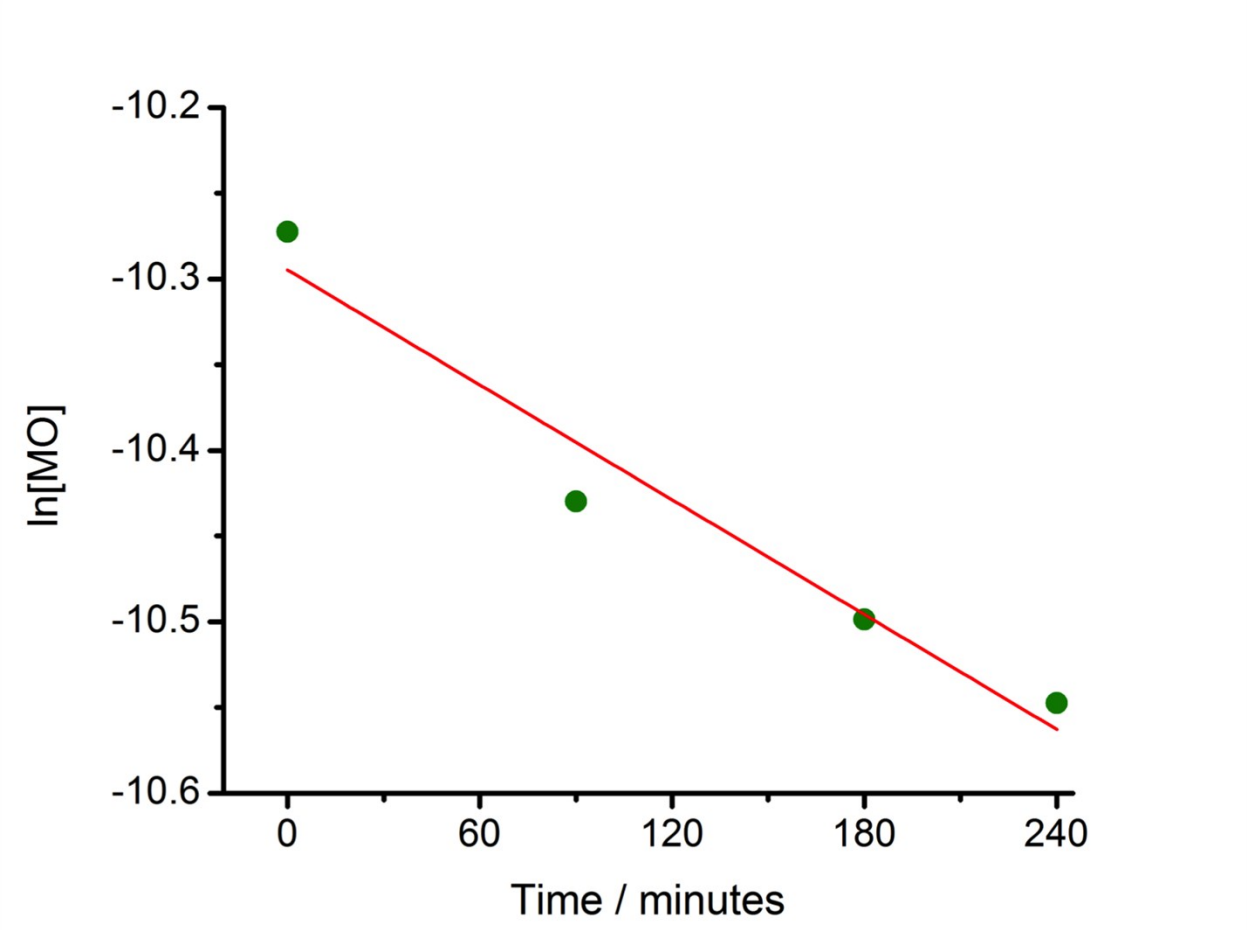

Figure S9: The change in concentration of the red form of methyl orange plotted as a first order kinetic plot, over the course of a reaction of 5%Cr_2O_3-$Nb_2O_5$with methyl orange under visible light.

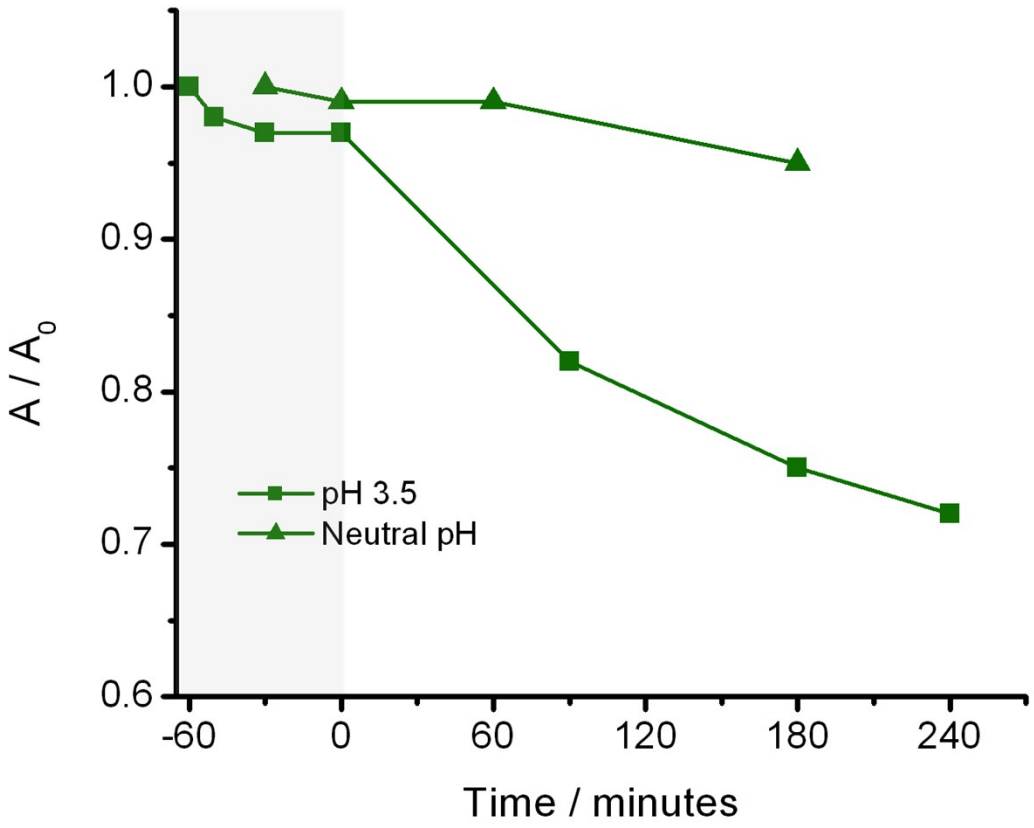

Figure S10: The change in concentration of methyl orange over the course of a reaction of visible light reaction with 5%Cr_2O_3-Nb_2O_5 at neutral pH, and pH 3.5