Electronic Supplementary Material (ESI) for Dalton Transactions.

Supporting information

Table 1. BVS results of the independent Nb and V atoms in compounds **1** and **2**.

Compound **1**	
Nb(1)	5.05
Nb(2)	5.19
Nb(3)	4.92
Nb(4)	4.25
Compound **2**	
Nb(1)	5.00
Nb(2)	4.93
Nb(3)	4.94
Nb(4)	4.99
Nb(5)	4.89
Nb(6)	4.98
Nb(7)	4.96
Nb(8)	4.97
Nb(9)	4.93
Nb(10)	4.92
Nb(11)	4.91
Nb(12)	4.93
V(1)	5.24
V(2)	5.12
V(3)	4.54
The equations used for the BVS of Nb are s=exp[(1.911-r)/0.37], while the equations used for the BVS of V are s=exp[(1.803-r)/0.37].[1] The BVS of V(3) is relatively lower than those of V(1) and V(2), which is caused by the disorder of V(3).	

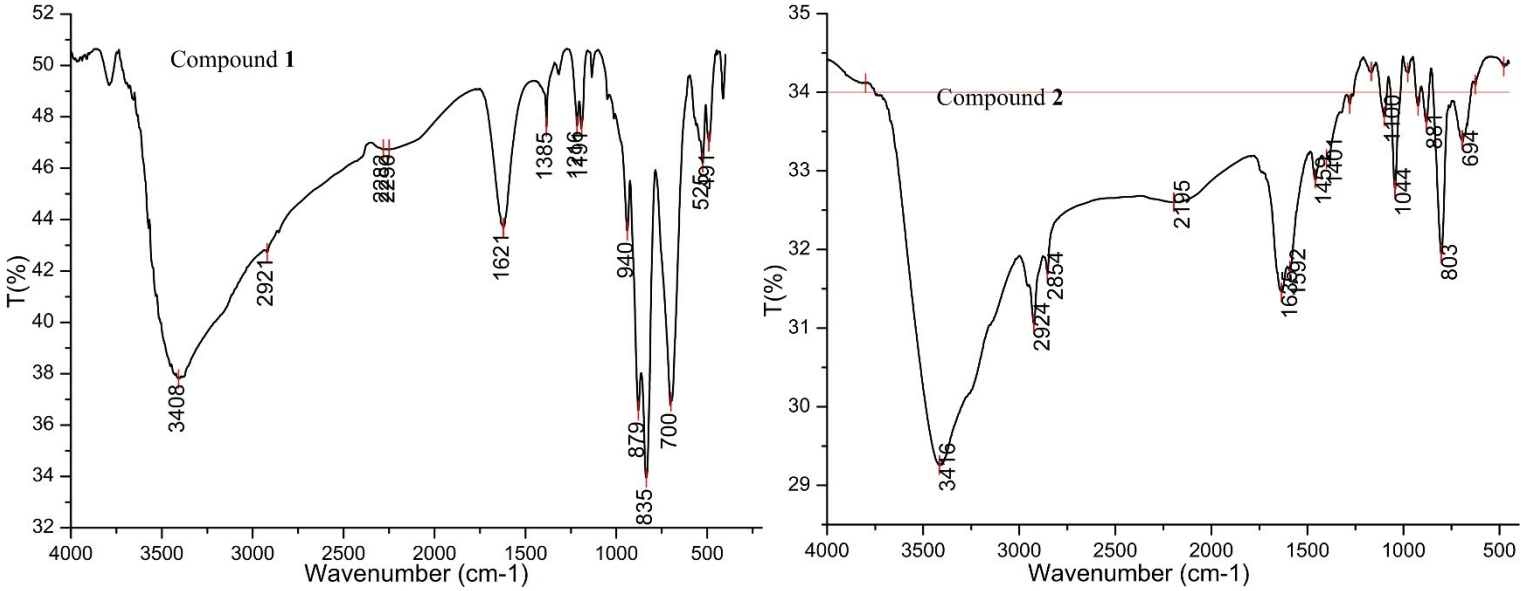


Fig. s1. IR spectra of compounds **1** and **2**.

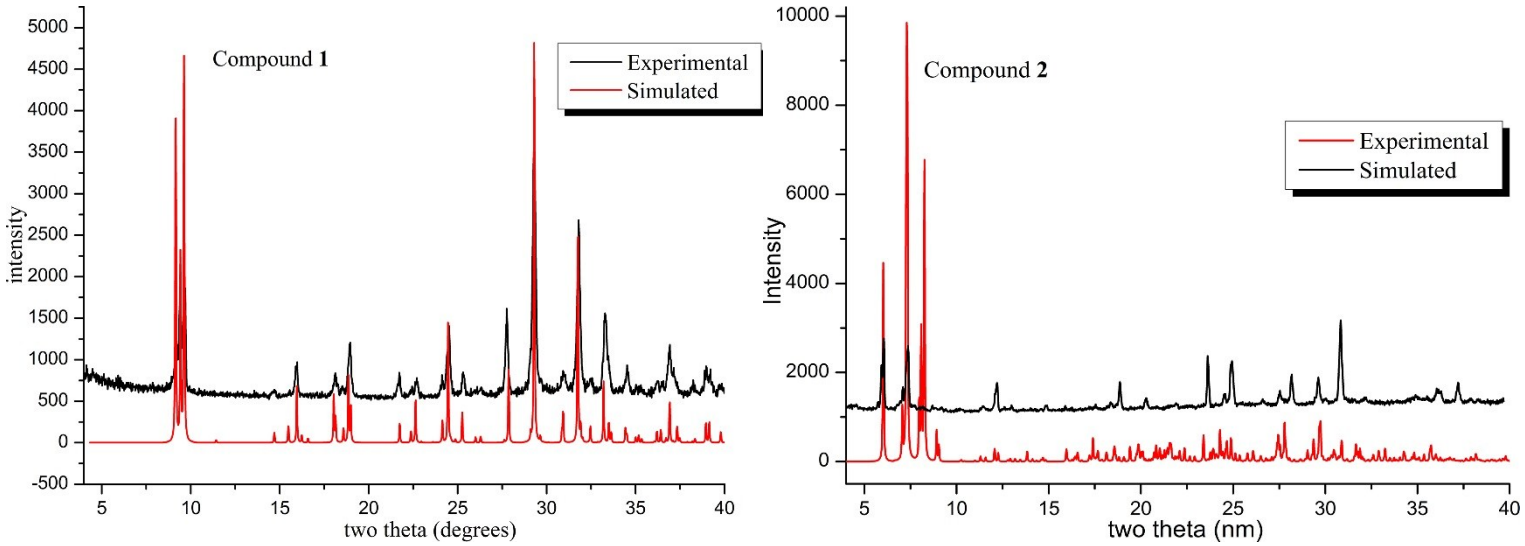


Fig. s2. Experimental and simulated XRD patterns of compounds **1** and **2**.

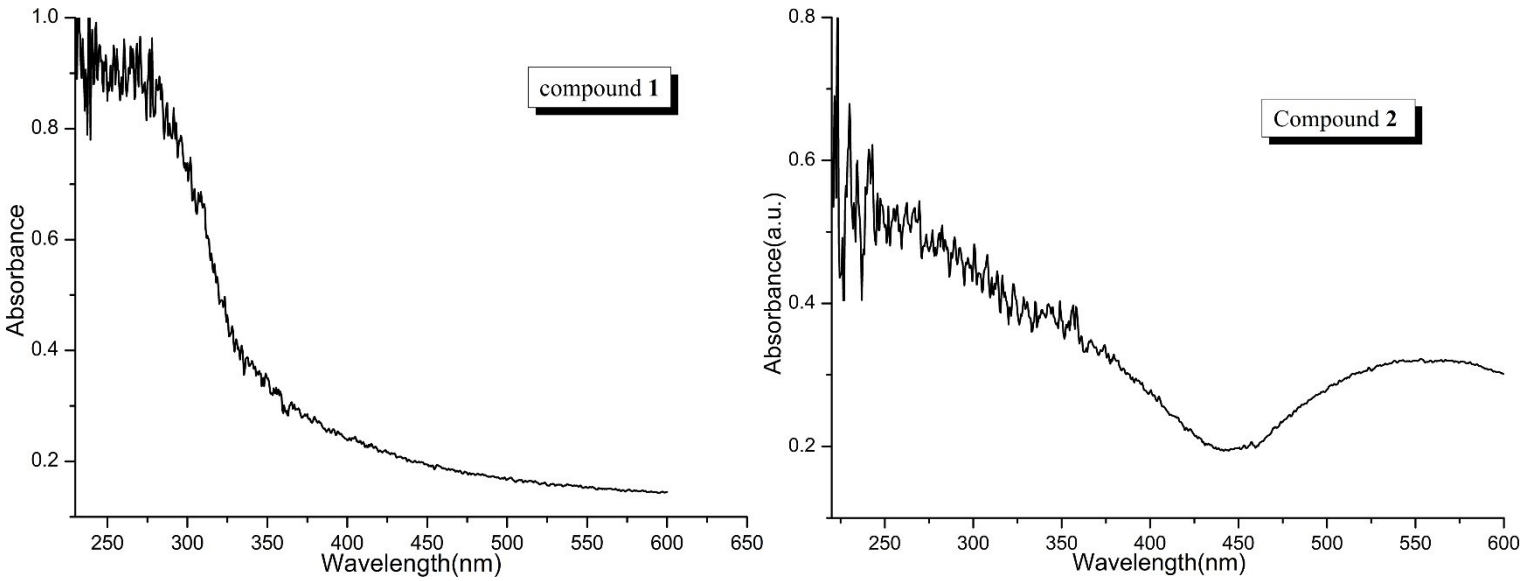


Fig. s3. Solid state UV-Vis spectra of compounds **1** and **2**.

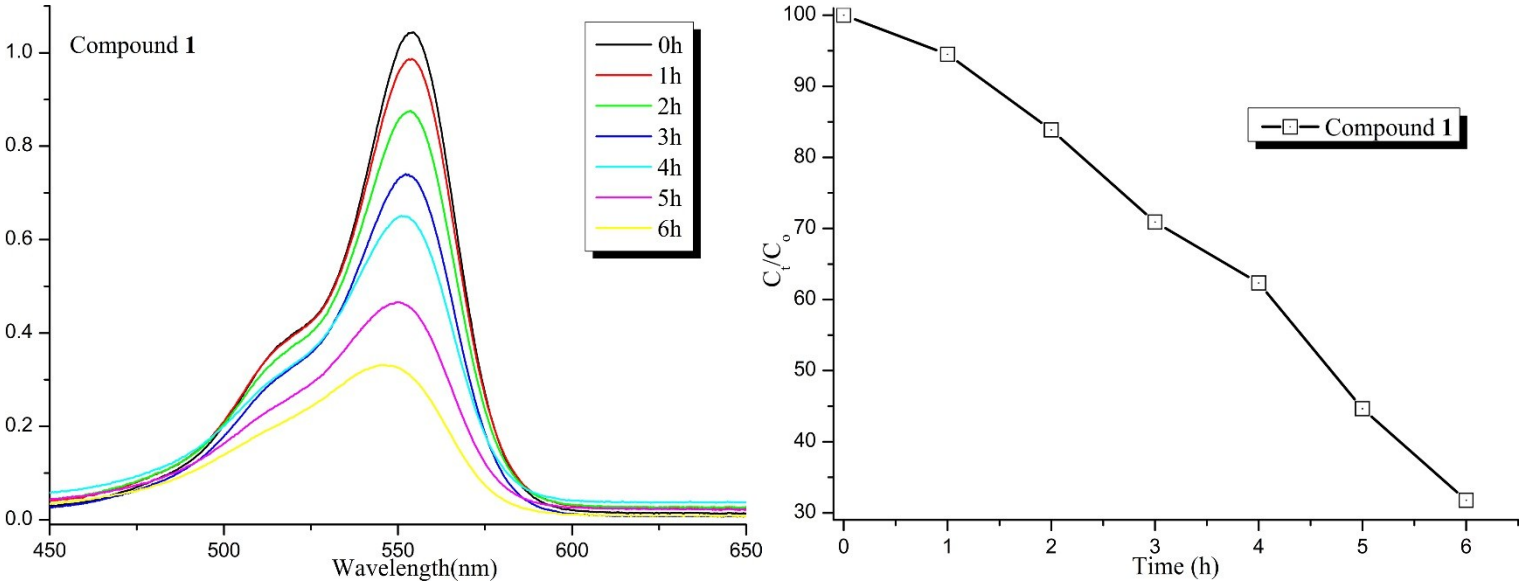


Fig. s4 the RhB photocatalytic degradation performance over compound **1**.

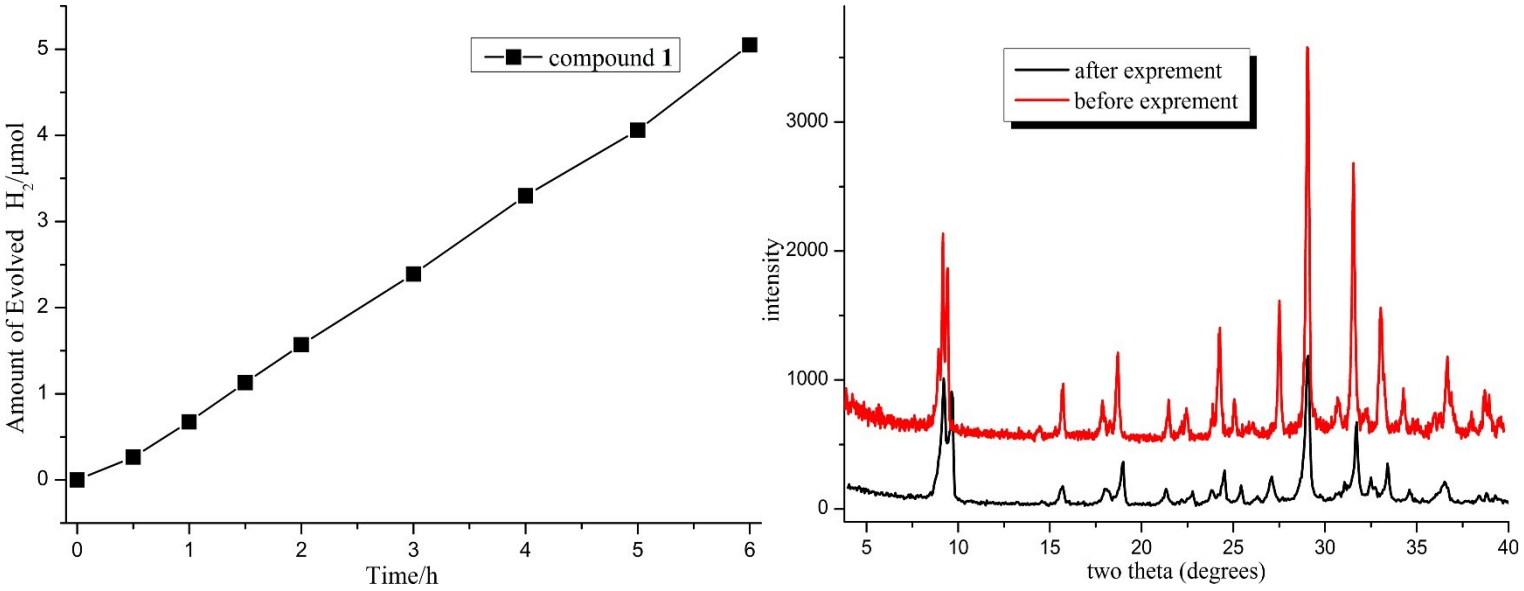


Fig. s5. (a Time course of H2 evolution from 50 mg of 0.1% Pt loaded photocatalyst compound **1** under 300 W Xe-lamp irradiation in 100 mL of aqueous solution containing 10 vol% methanol solution. (b) Time course of the total H2 evolution in 6 hours.

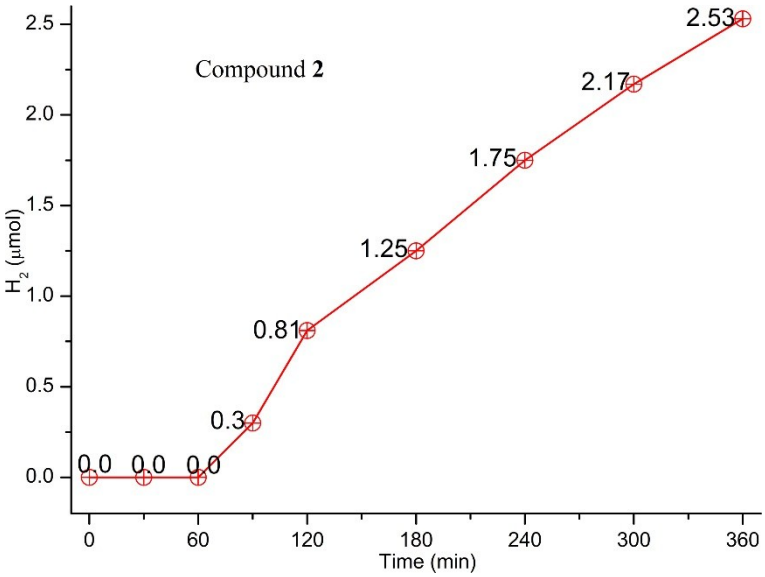
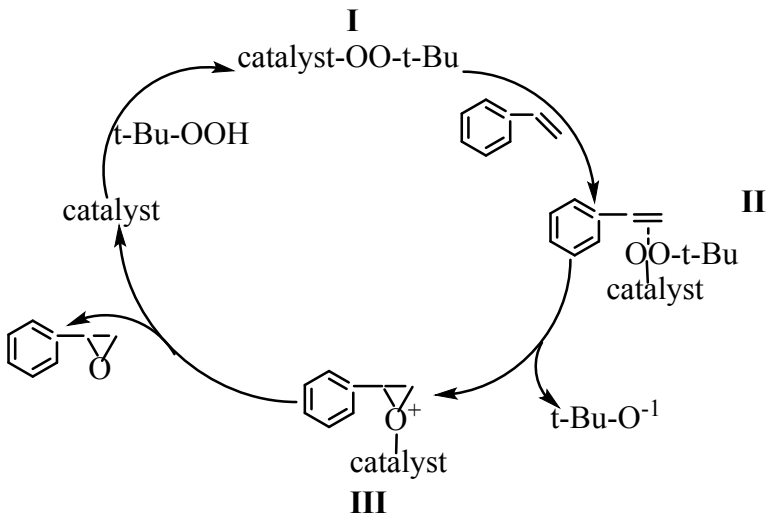


Fig. s6 Fig. 2 H_2-evolution upon Xe-lamp irradiation of 10mg of 0.1% Pt loaded PONb catalysts in 100 mL MeOH–H_2O solution (10% v/v).



Scheme s1. Schematic illustration of the proposed reaction mechanism for the styrene oxidation reaction.

References:

1. I. D. Brown and D. Altermatt, *Acta. Cryst.* , 1985, **B41**, 244.