

Supplementary Materials: Dehydrogenative Oxidation of Alcohols Catalyzed by Highly Dispersed Ruthenium Incorporated Titanium Oxide

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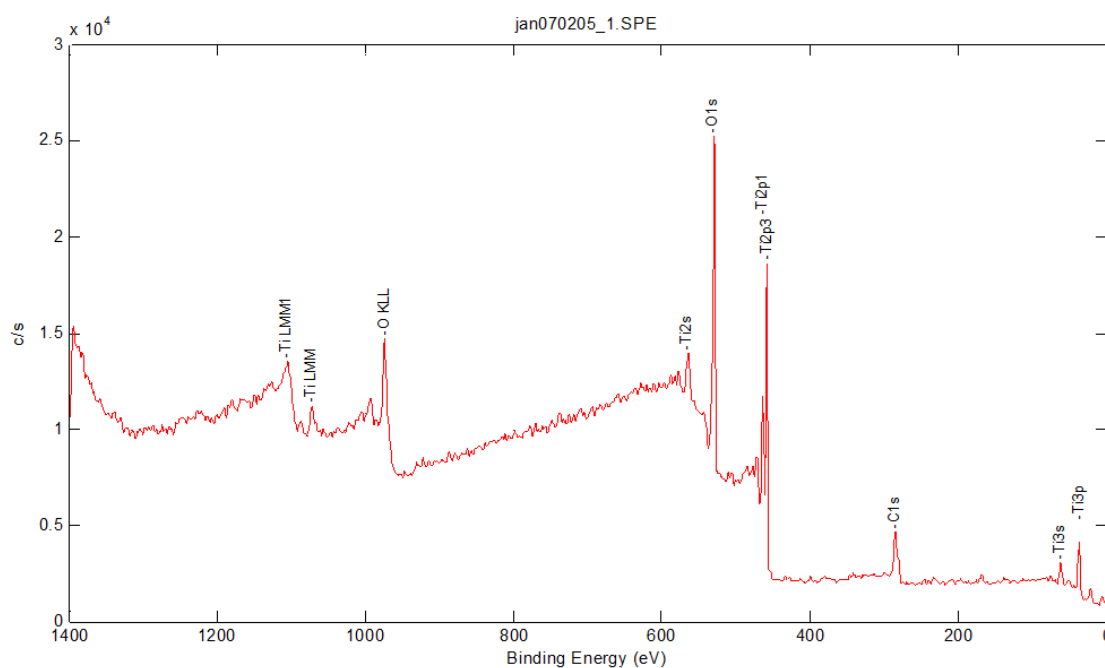


Figure S1. The survey XPS spectrum of Ru_{0.07}TiO₂.

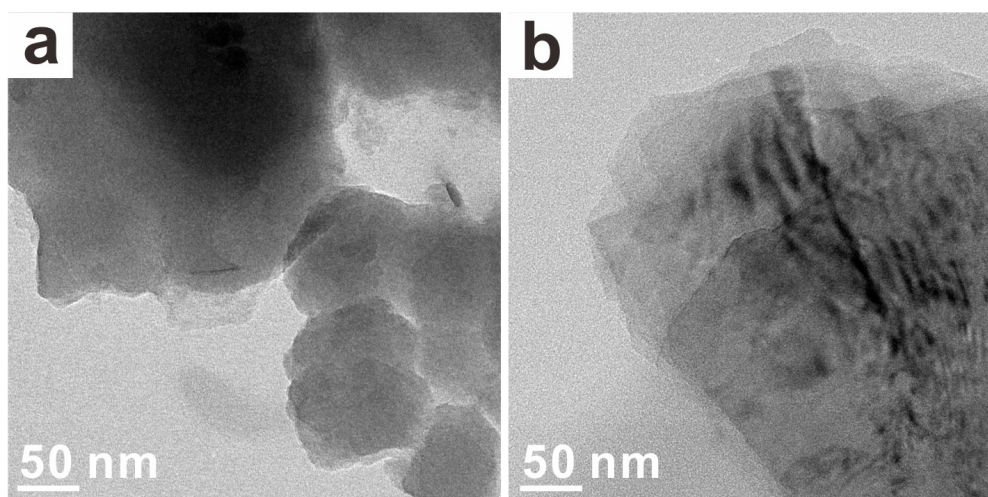


Figure S2. TEM image of A-Ru_{0.07}/TiO₂. After annealing, crystallites aggregate each other to form large crystallites without particular shape. (a) TEM image; (b) aggregation of crystallites.

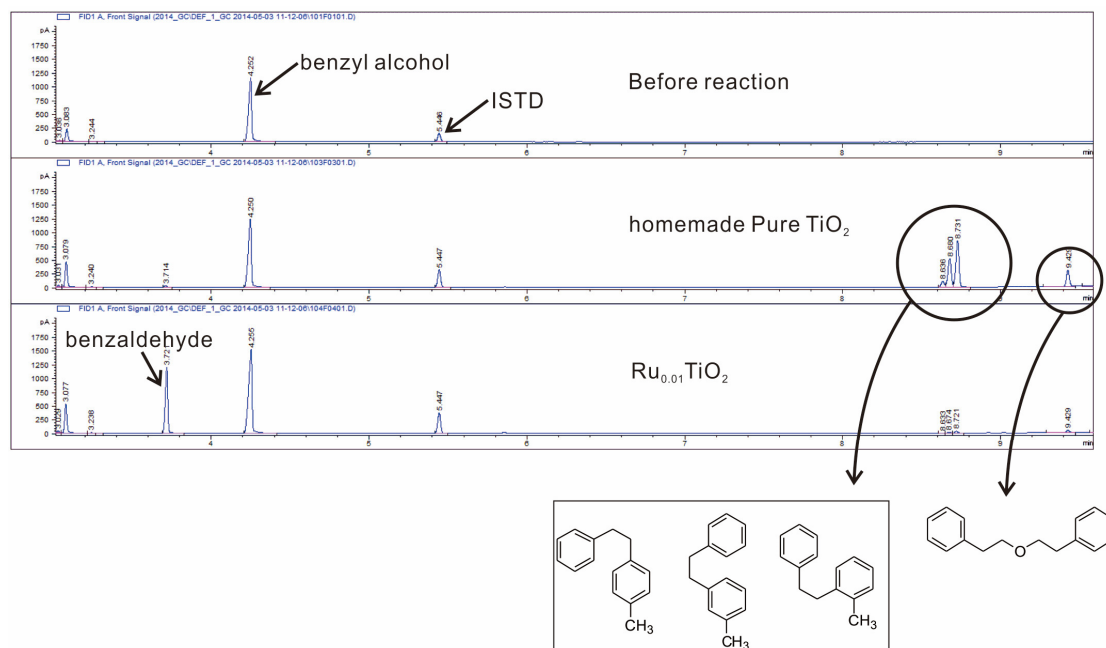
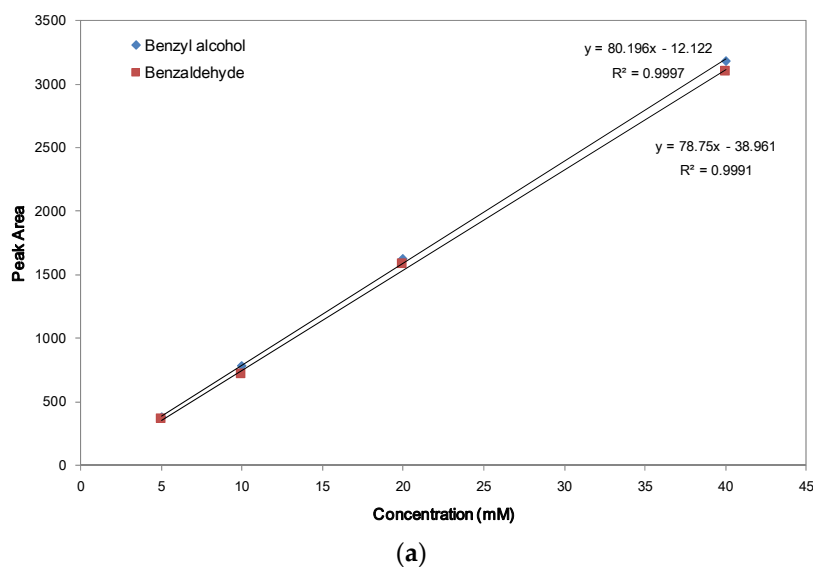


Figure S3. (Top) Conversion data from analysis of gas chromatography (GC, Agilent 7890A, Agilent Technologies, Santa Clara, CA, USA). Dodecane was used as internal standard for the calculation of conversion (**middle**); the main products by pure TiO₂ were *o*, *m*, *p*-benzyltoluenes which are produced by Friedel-Crafts alkylation of toluene (solvent) with benzyl alcohol. In addition dibenzyl ether is also produced by the acid catalyzed homo-coupling of benzyl alcohol (**bottom**).



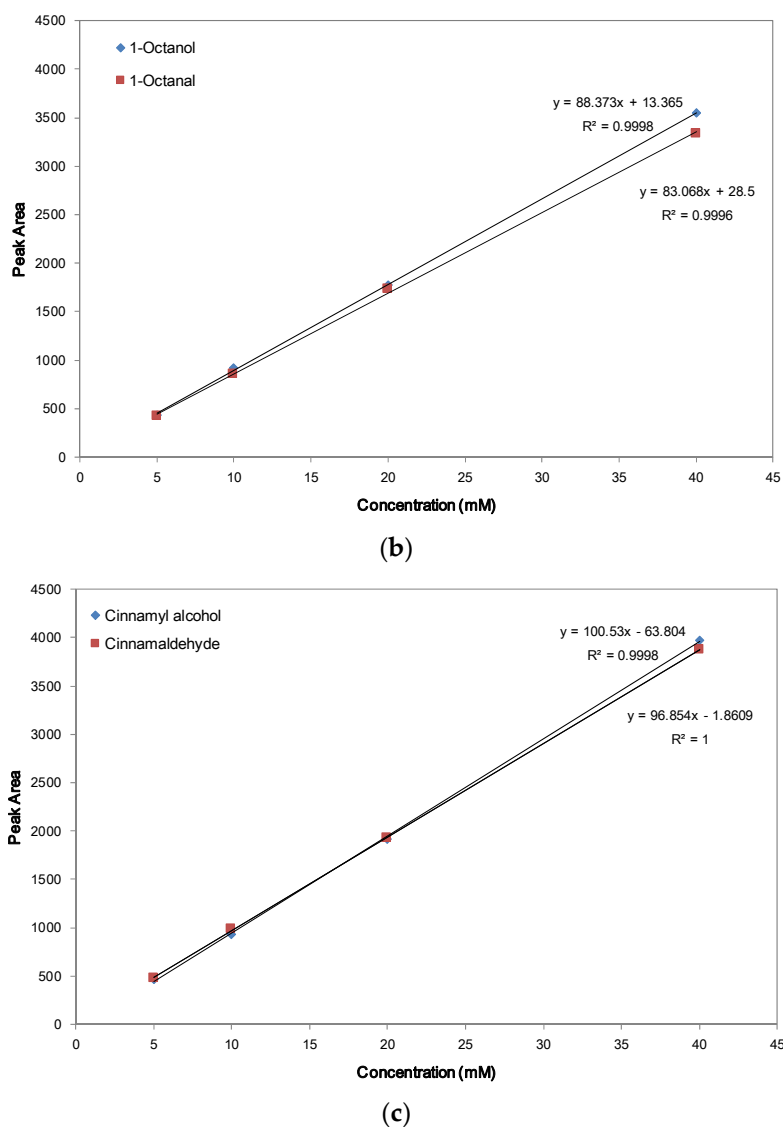
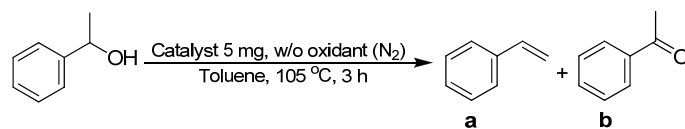


Figure S4. The calibration curves of alcohols and aldehydes. The flame ionization detector was used. (a) Benzyl alcohol and benzaldehyde; (b) 1-octanol and 1-octanal; (c) cinnamyl alcohol and cinnamaldehyde.

Table S1. Catalytic properties of 1-phenyl ethanol oxidation under oxidant-free condition.



Samples	t (h)	Conversion (%)	Yield	
			a	b
None	3	0	-	-
Degussa, P25	3	2	-	2
pure TiO_2	3	100	89	2
$Ru_{0.01}TiO_2$	3	100	76	7
$Ru_{0.03}TiO_2$	3	100	68	16
$Ru_{0.05}TiO_2$	3	100	65	19
$Ru_{0.07}TiO_2$	3	100	58	32