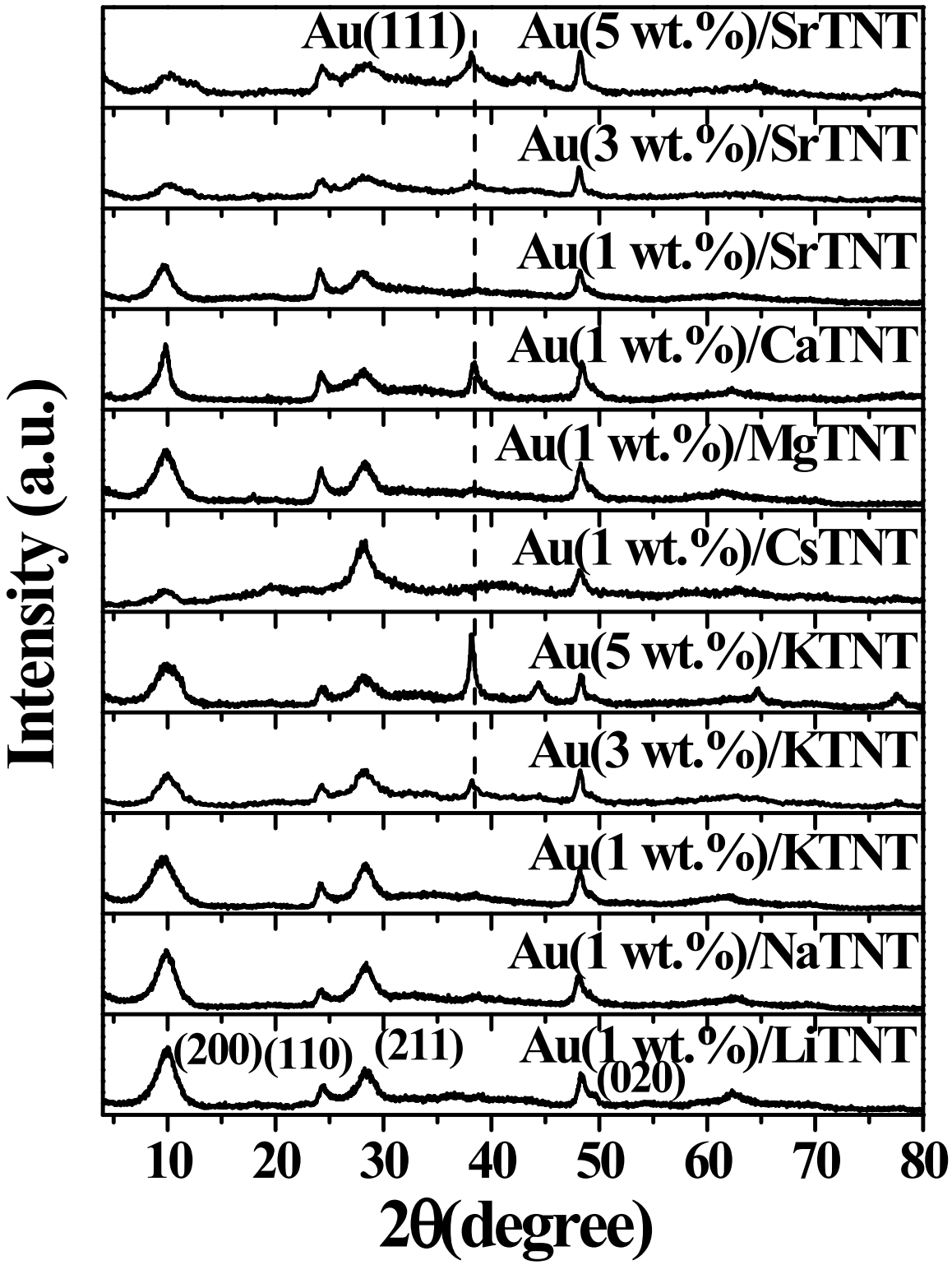
Supplementary Data

Effect of alkali and alkaline earth metal ions on benzyl alcohol oxidation activity of titanate nanotubes-supported Au catalysts

Devadutta Nepak[ab] and D. Srinivas*[ab]

[a]*Catalysis Division, CSIR-National Chemical Laboratory, Pune—411008, India. E-mail: d.srinivas@ncl.res.in; Fax: +91 20 2590 2633; Tel: +91 20 2590 2018*

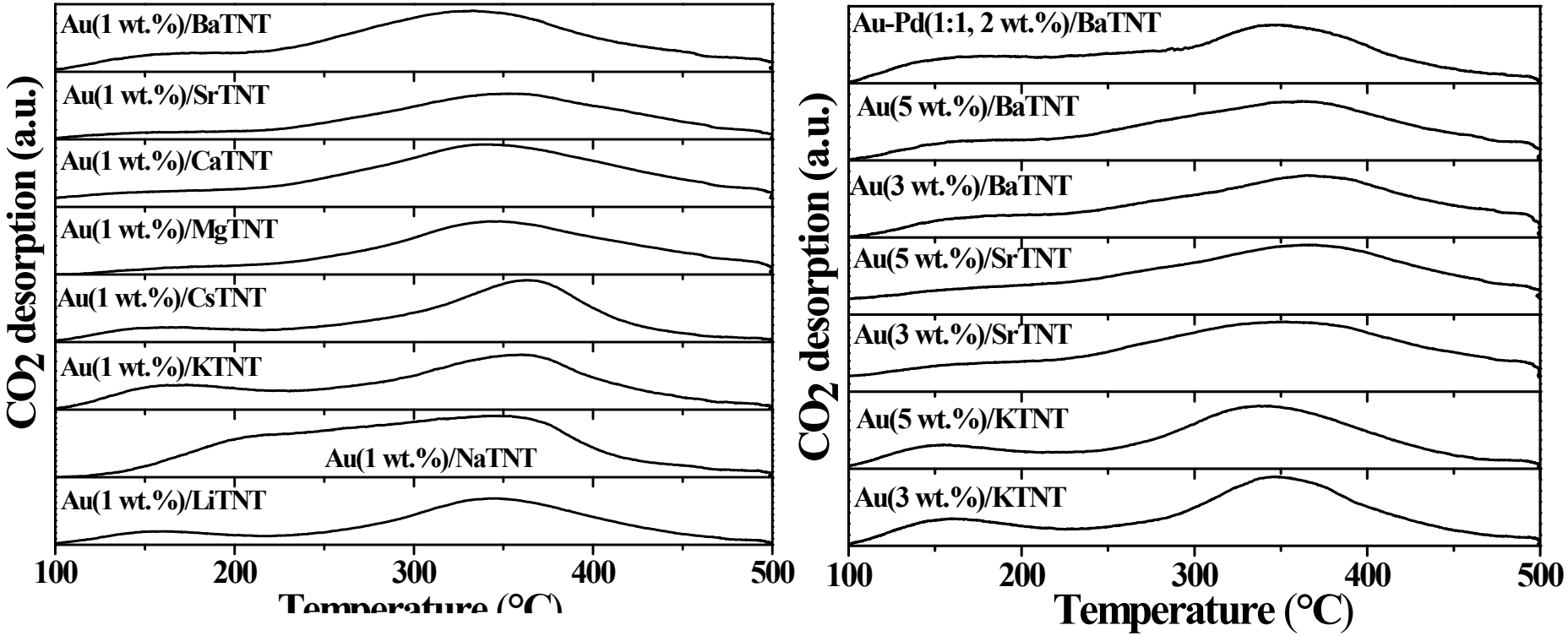
[b]*Academy of Scientific and Innovative Research (AcSIR), New Delhi—110 001, India*



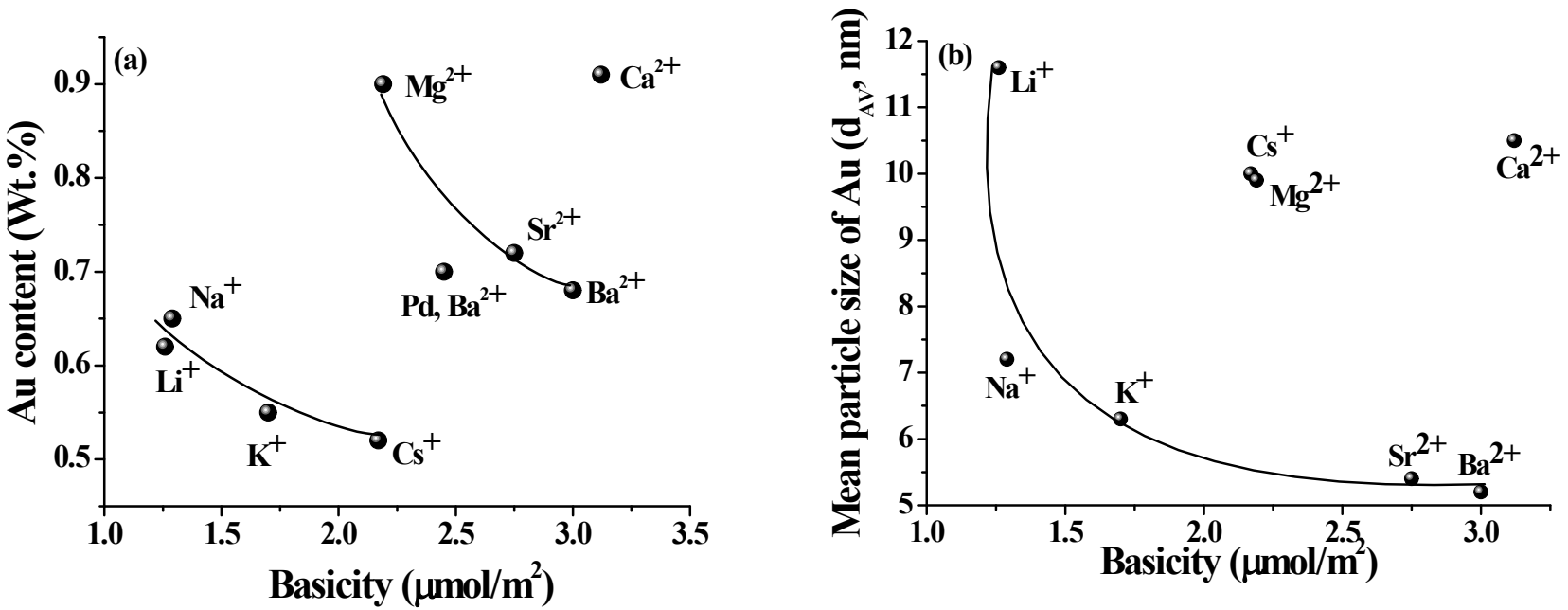
S1. XRD patterns of supported gold catalysts.

S.No.	Sample	Textural properties		
		S_{BET} (m^2/g)	Pore volume (cm^3/g)	Pore diameter (nm)
1	LiTNT	196	0.54	5.2
2	NaTNT	188	0.65	6.5
3	KTNT	194	0.47	4.5
4	CsTNT	132	0.36	4.8
5	MgTNT	179	0.41	6.6
6	CaTNT	185	0.55	6.2
7	SrTNT	182	0.48	5.8
8	BaTNT	175	0.40	6.0

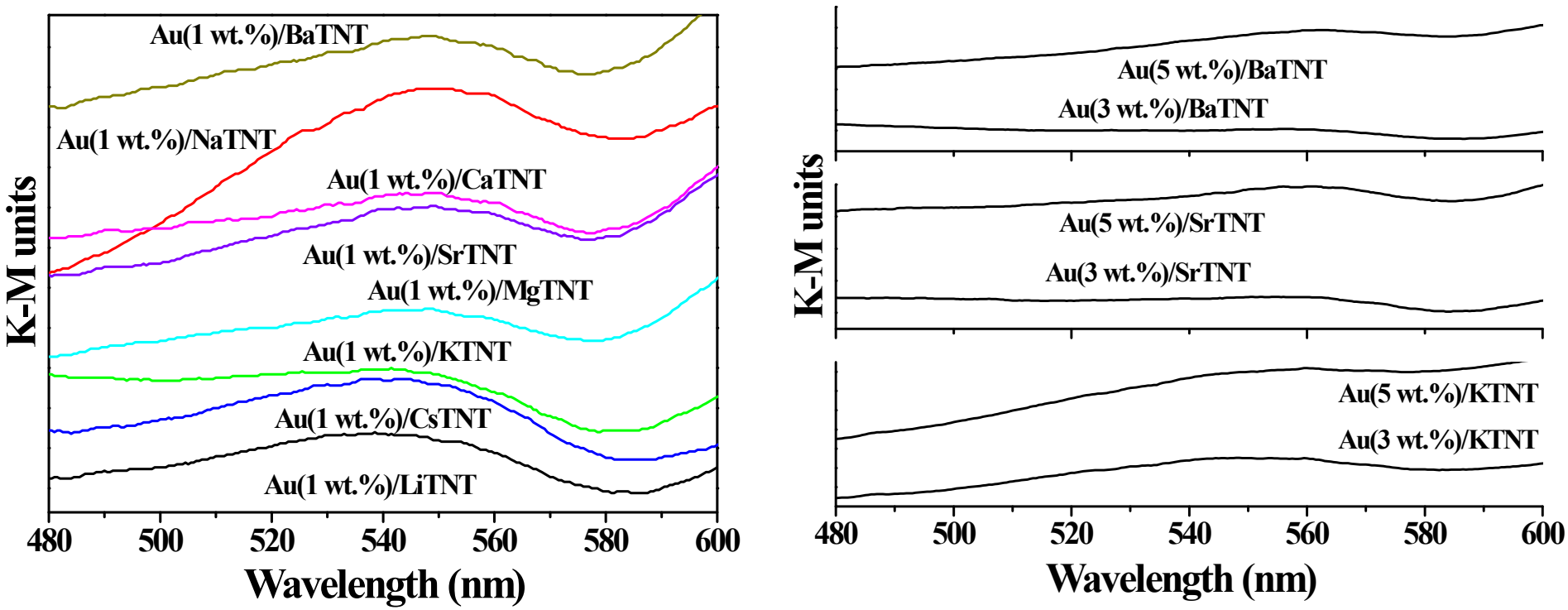
S2. N_2 physisorption data for ATNT supports.



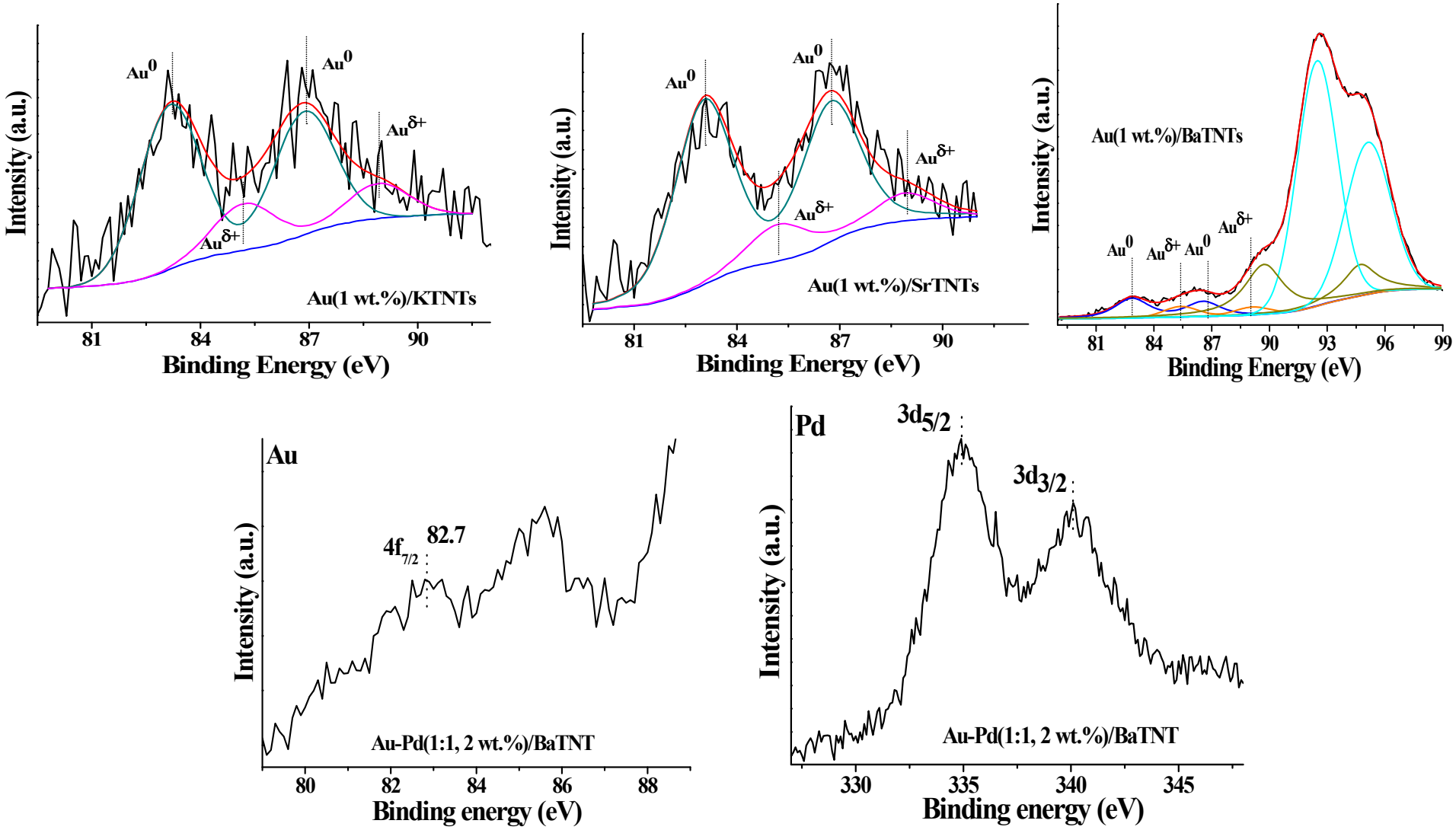
S3. CO_2-TPD profiles of Au/ATNT catalysts



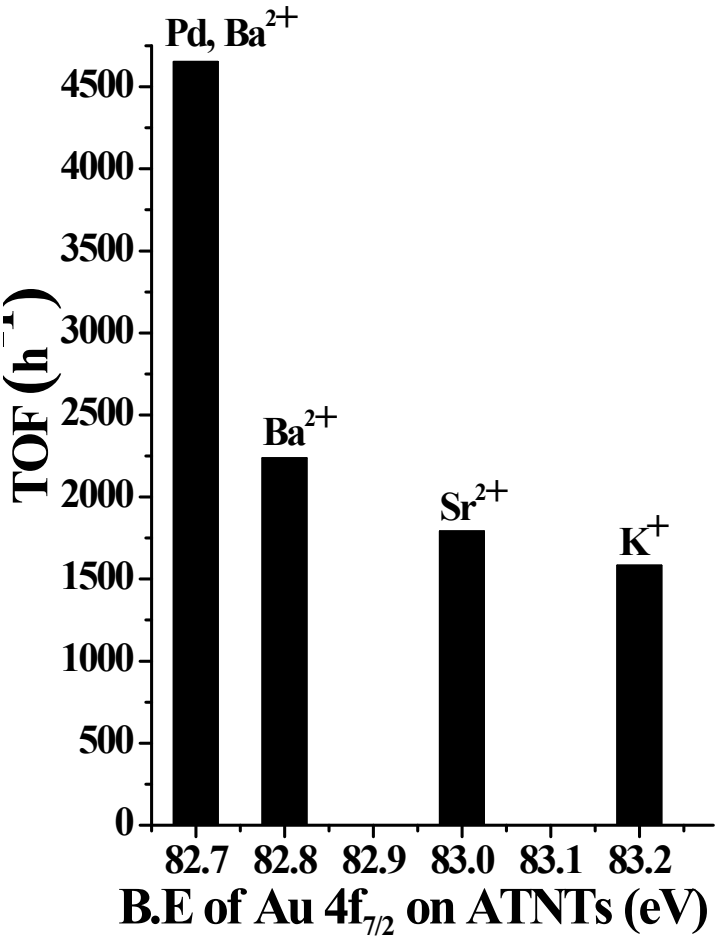
S4. Influence of basicity of the catalyst on (a) Au uptake and (b) mean particle size of Au.



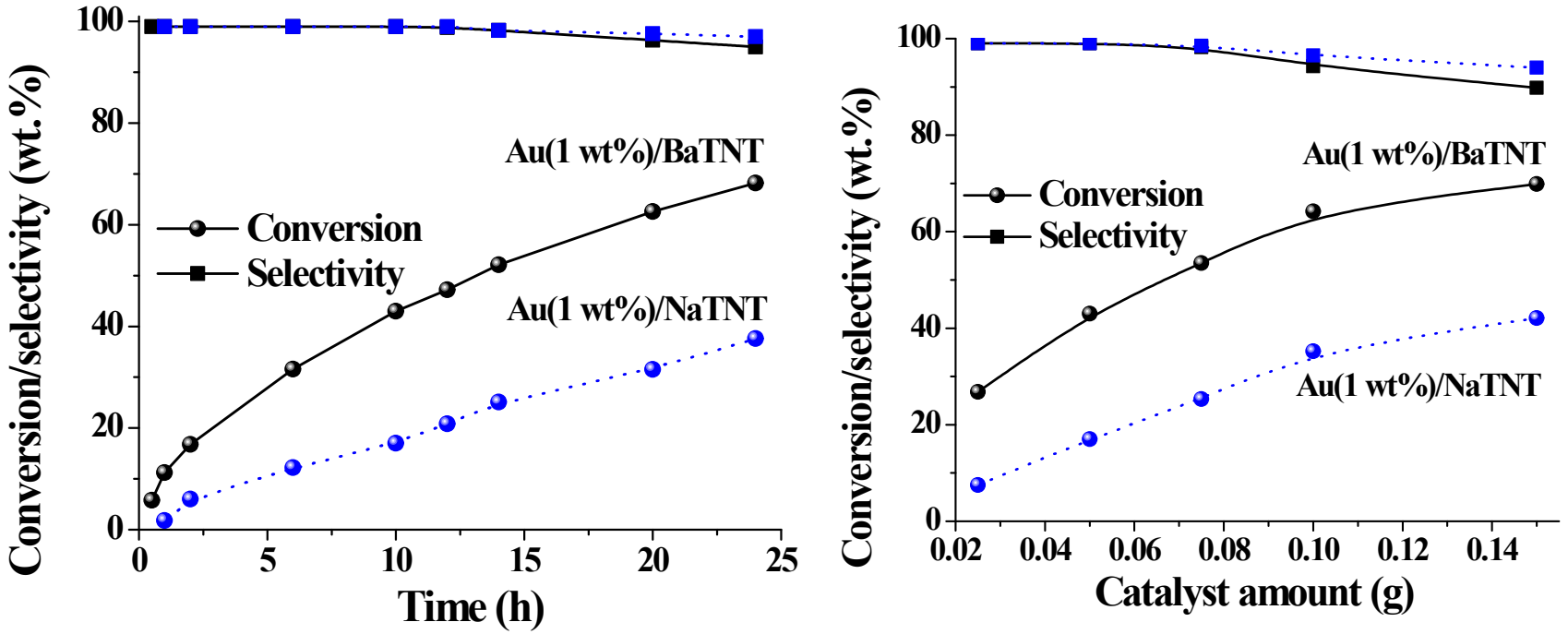
S5. DRUV-vis spectra for Au/ATNT catalysts.



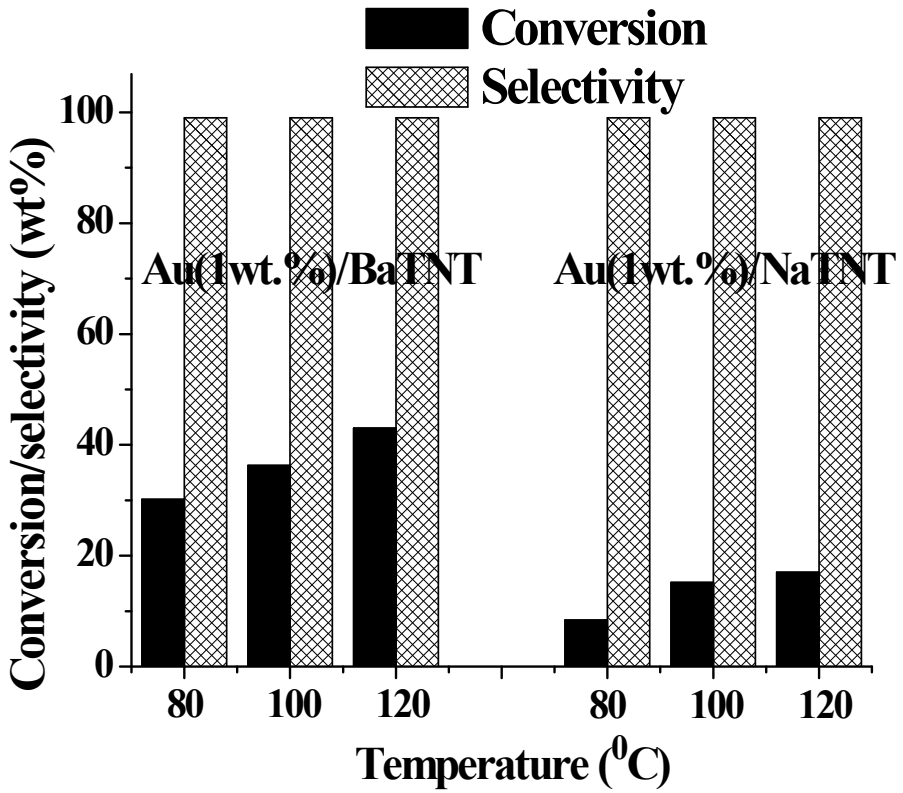
S6. XPS profiles of Au(1 wt.%) on KTNT, SrTNT and BaTNT in Au 4f region and of Au-Pd(1:1, 2 wt.%)/BaTNT in Au 4f & Pd 3d regions



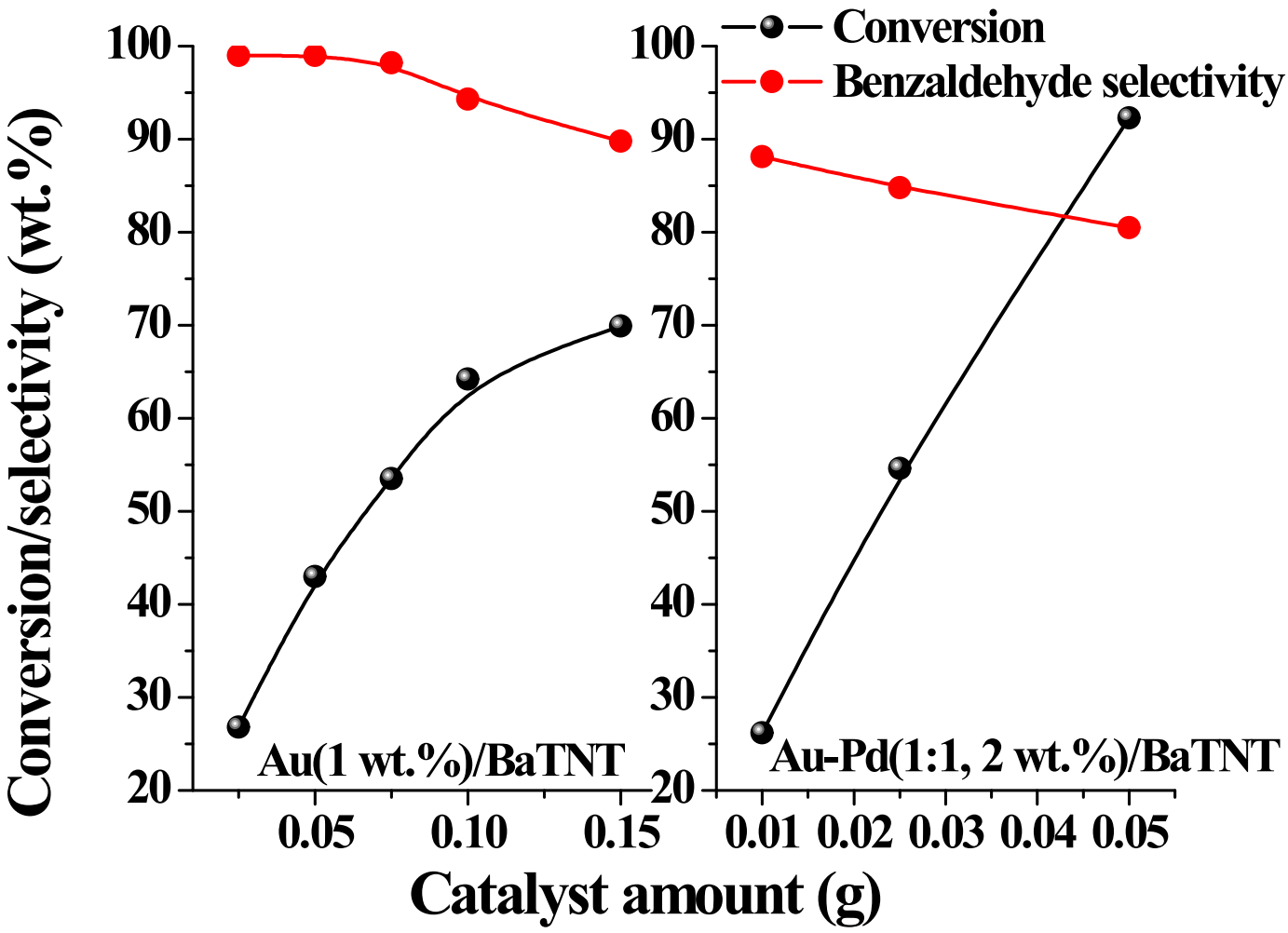
S7. Correlation between B.E. values and catalytic activity (TOF, h^{-1}) of Au.



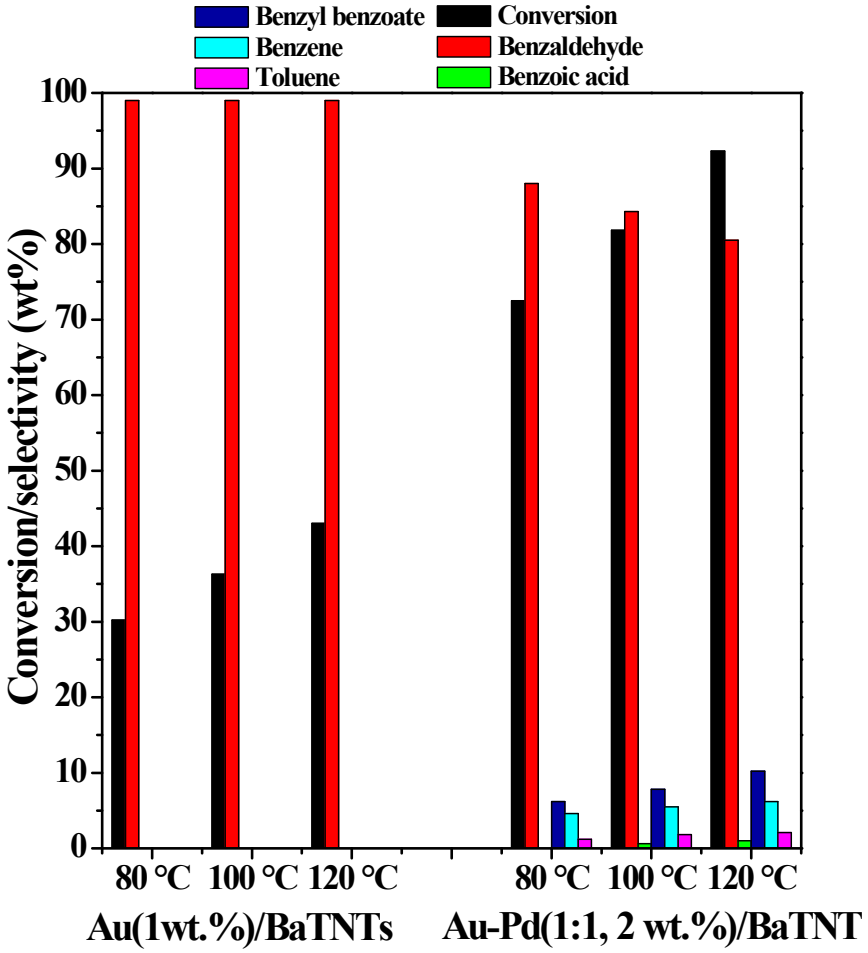
S8. Influence of reaction time and catalyst amount on conversion of benzyl alcohol and selectivity for benzaldehyde. Reaction conditions: Left - catalyst = 0.05 g, benzyl alcohol = 25 mmol, $p(O_2)$ = 1 atm, reaction temperature = 120 °C, and reaction time = 0 - 25 h. Right - catalyst = 0.025 – 0.15 g, benzyl alcohol = 25 mmol, $p(O_2)$ = 1 atm, reaction temperature = 120 °C, and reaction time = 10 h.



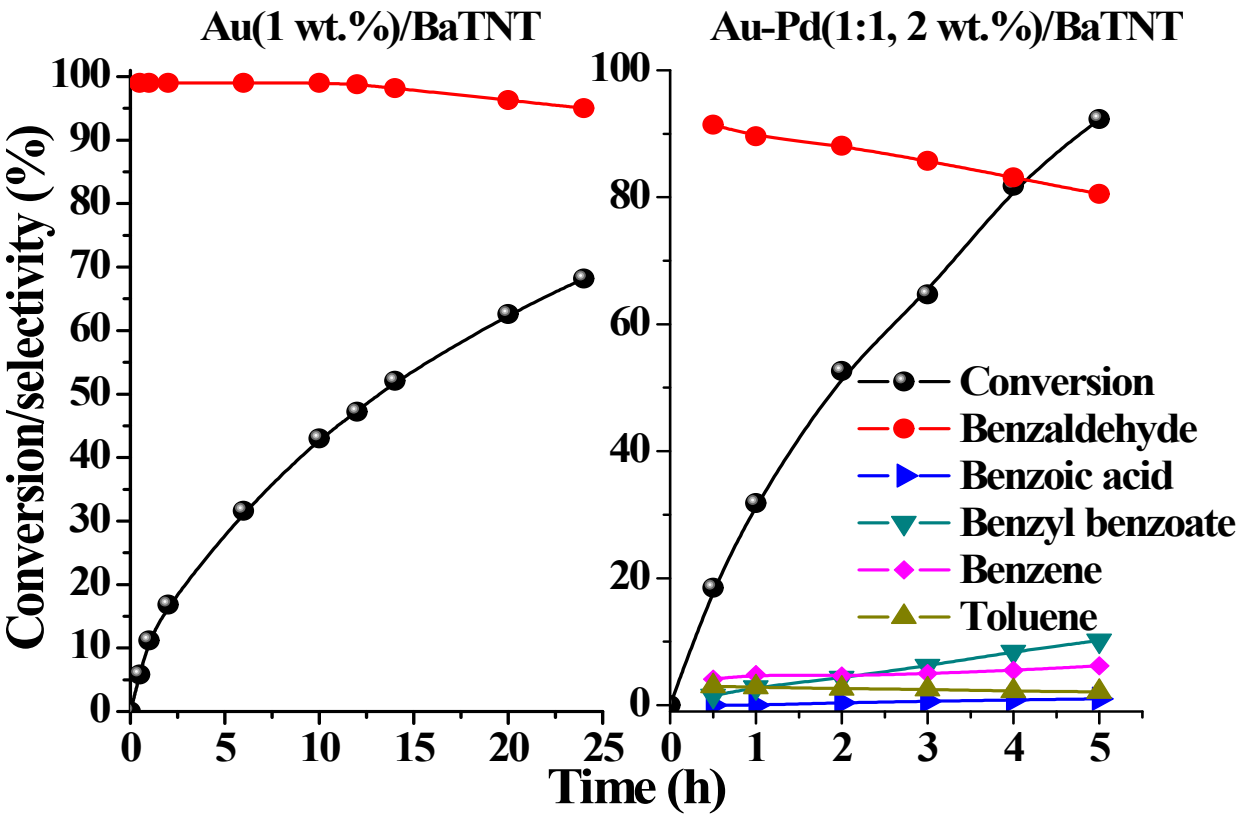
S9. Influence of reaction temperature on the conversion of benzyl alcohol and selectivity of benzaldehyde. Reaction conditions: catalyst = 0.05 g, benzyl alcohol = 25 mmol, $p(O_2)$ = 1 atm, reaction temperature = 80-120 °C, and reaction time = 10 h.



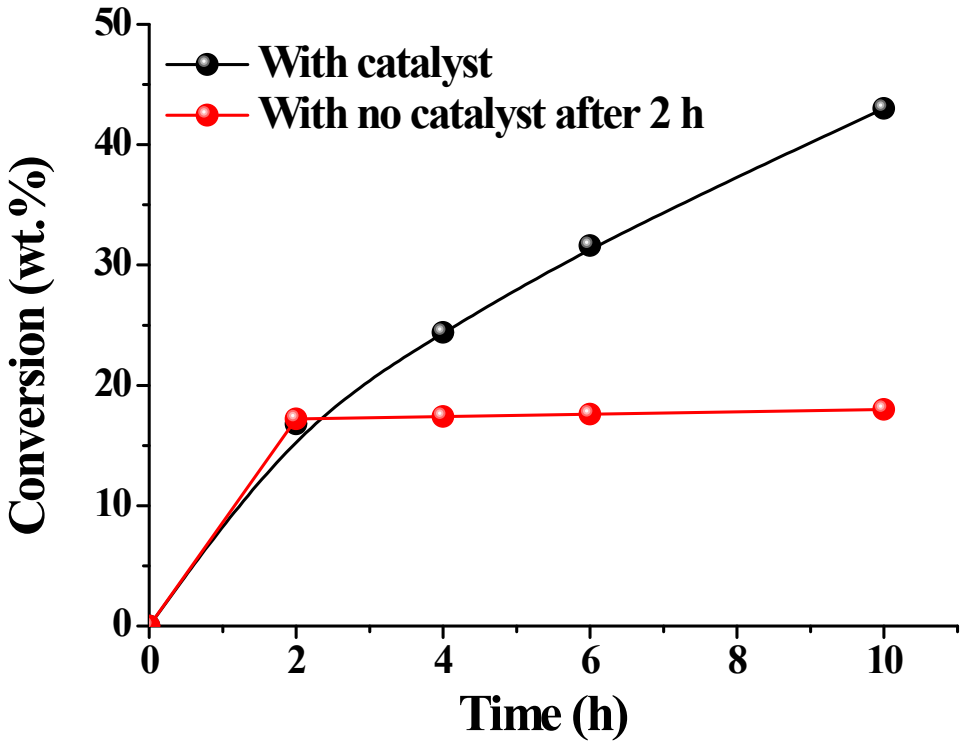
S10 (a) Influence of catalyst amount on the catalytic activity and product selectivity of Au(1 wt%) and Au-Pd (2 wt%, 1:1) supported on BaTNT. Reaction conditions: benzyl alcohol = 25 mmol, p(O_2) = 1 atm, reaction temperature = 120 °C and reaction time = 10 h for Au and 5 h for Au-Pd.



S10(b) Influence of reaction temperature on the catalytic activity and product selectivity of Au(1 wt%) and Au-Pd (2 wt%, 1:1) supported on BaTNT. Reaction conditions: catalyst = 0.05 g, benzyl alcohol = 25 mmol, p(O_2) = 1 atm, reaction temperature = 80-120 °C and reaction time = 10 h for Au and 5 h for Au-Pd.



S10(c). Influence of Reaction time on the catalytic activity and product selectivity of Au(1 wt%) and Au-Pd (2 wt%, 1:1) supported on BaTNT. Reaction conditions: catalyst = 0.05 g, benzyl alcohol = 25 mmol, $p(O_2)$ = 1 atm, reaction temperature = 120 °C.



S11. Hot filtration test for oxidation of benzyl alcohol over Au(1 wt%)/BaTNT. Reaction conditions: catalyst = 0.05 g, benzyl alcohol = 25 mmol, $p(O_2)$ = 1 atm, reaction temperature = 120 °C, and reaction time = 10 h.