

Supporting information

(including two figures and three tables, totally four pages)

Clean Synthesis of Epoxidized Tung Oil Derivatives via Phase Transfer Catalyst and Thiol-ene Reaction: A detail Study

Puyou Jia[†], Yufeng Ma[‡], Haoyu Xia[§], Minrui Zheng[†], Guodong Feng[†], Lihong Hu[†], Meng Zhang^{†*}, Yonghong Zhou[†]

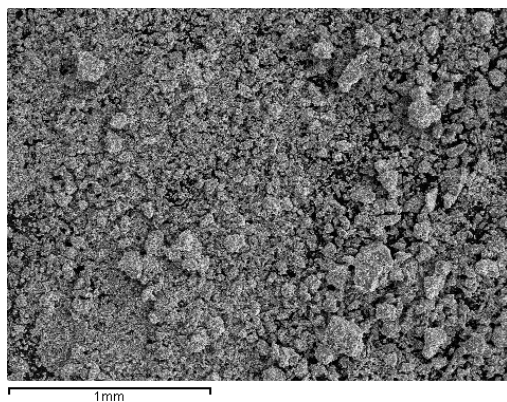
[†]Institute of Chemical Industry of Forest Products, Chinese Academy of Forestry (CAF); National Engineering Lab for Biomass Chemical Utilization; Key Lab on Forest Chemical Engineering, State Forestry Administration; Co-Innovation Center of Efficient Processing and Utilization of Forest Resources, Nanjing Forestry University; and Key Lab of Biomass Energy and Materials, Jiangsu Province, 16 Suojin North Road, Nanjing 210042, P. R. China.

Nanjing Forestry University, College of Materials Science and Engineering, 159 Longpan Road, Nanjing 210037, P. R. China

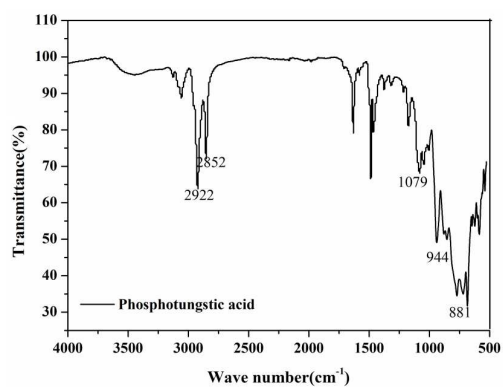
[§]Nanjing Tech University, College of Chemical Engineering, 30 Pu Zhu Road, Nanjing 211800, P. R. China

*Corresponding Author: zhangmeng82@163.com (M.Z.)

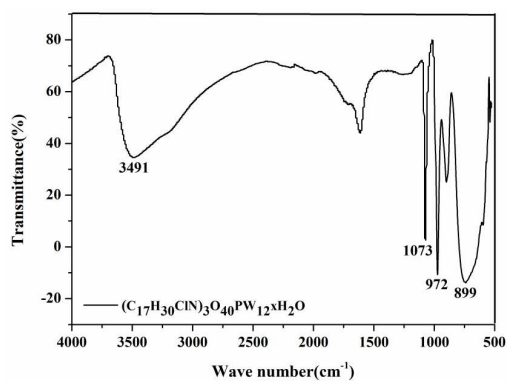
(a)



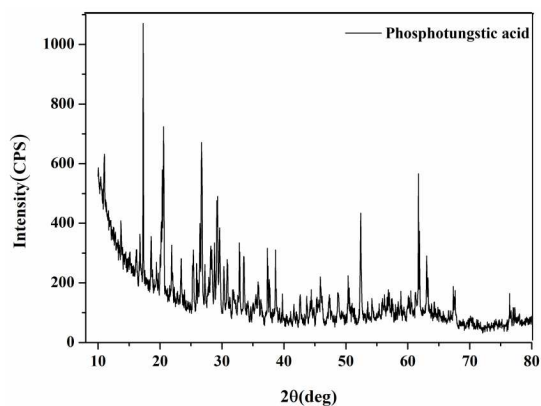
(b)



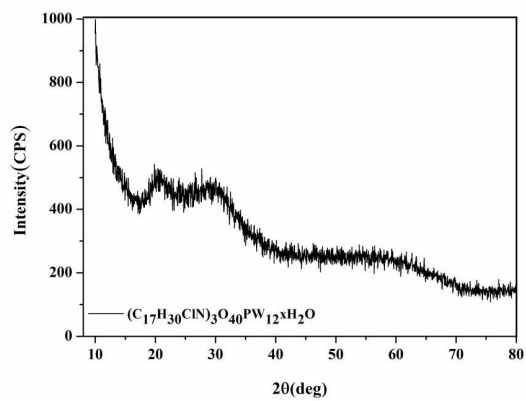
(c)



(d)



(e)



(f)

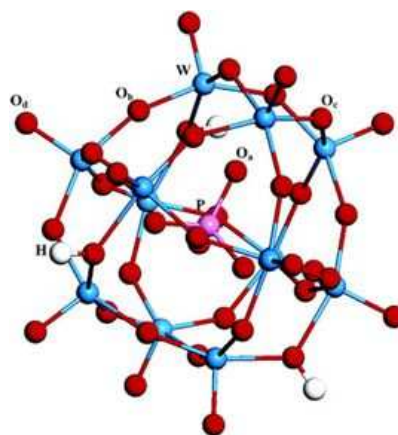


Fig.S1 (a) Surface structure of $(C_{17}H_{30}ClN)_3O_{40}PW_{12}xH_2O$ at mm level. (b) FT-IR spectra of phosphotungstic acid. (c) FT-IR spectra of $(C_{17}H_{30}ClN)_3O_{40}PW_{12}xH_2O$. (d) XRD powder patterns of phosphotungstic acid. (e) XRD powder patterns of $(C_{17}H_{30}ClN)_3O_{40}PW_{12}xH_2O$. (f) Space structure of phosphotungstic acid.

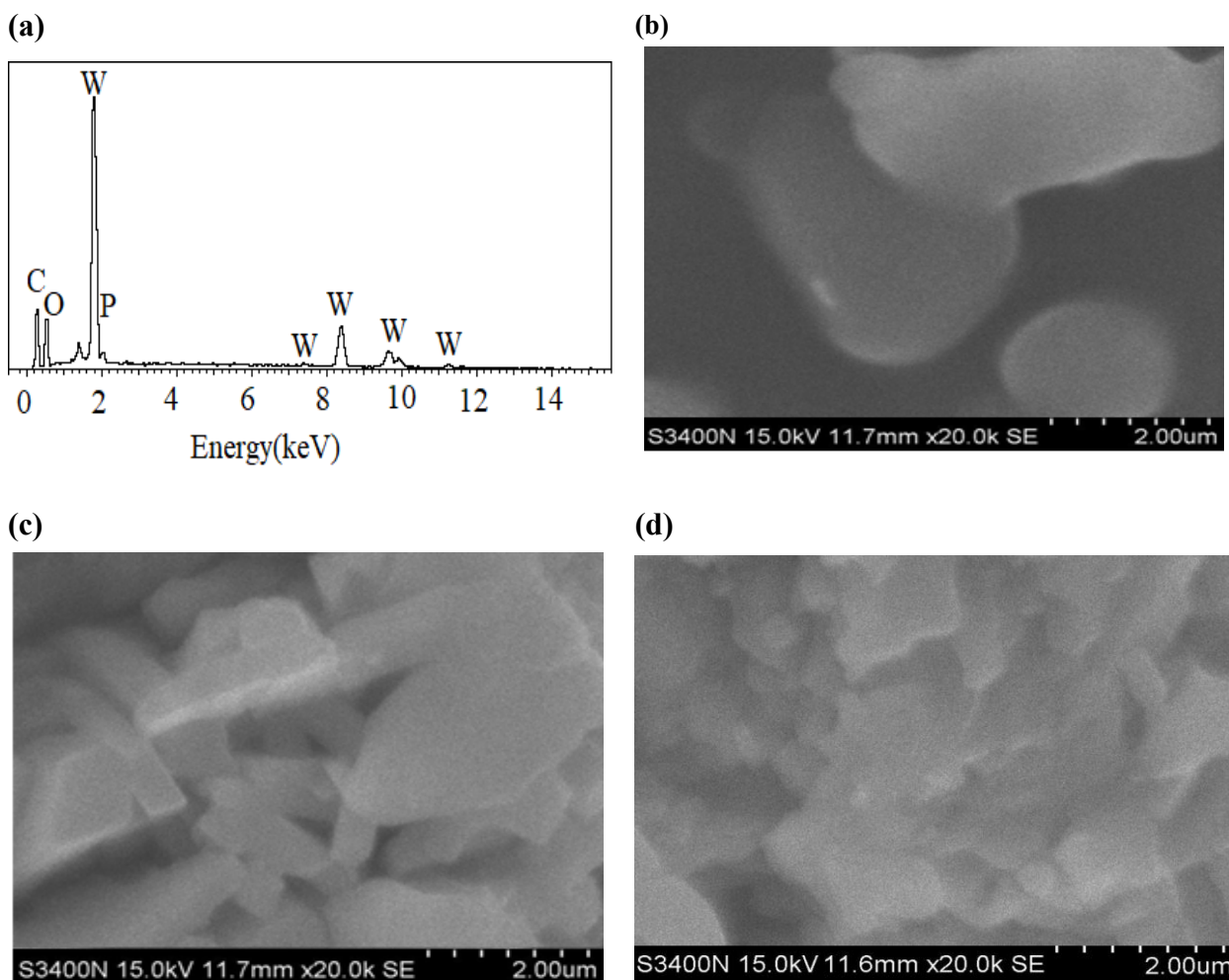


Fig.S2 (a) EDS of $(C_{17}H_{30}ClN)_3O_{40}PW_{12}xH_2O$. (b) SEM picture of dodecylpyridinium chloride. (c) SEM picture of phosphotungstic acid. (d) SEM picture of $(C_{17}H_{30}ClN)_3O_{40}PW_{12}xH_2O$.

Table S1 Formulations of PVC films

	FD	FE1	FE2	FE3	FE4	FT1	FT2	FT3	FT4	FP
PVC	2	2	2	2	2	2	2	2	2	2
DOP	0.8									
ETM		0.2	0.4	0.6	0.8					
TEP						0.2	0.4	0.6	0.8	

Table S2 TGA results of DOP, ETM and TEP

PVC films	T ₅	T ₅₀	Char residue
DOP	176	249	0.12
ETM	212	322	6.20
TEP	214	330	7.03

Table S3 TGA results of PVC films

PVC films	T ₅ (□)	T ₅₀ (□)	Tg(□)	Char residue(%)
PVC	276.5	344.6	82.5	5.8
FE1	238.4	329.1	62.3	8.3
FE2	234.1	321.4	46.2	11.9
FE3	234.2	314.5	40.8	12.5
FE4	229.4	317.2	27.2	12.8
FT1	252.7	331.7	68.5	7.6
FT2	247.8	330.0	48.1	8.7
FT3	243.1	328.4	41.7	10.2
FT4	235.7	318.2	28.6	12.1
FD	217.1	316.4	29.4	4.2