Electronic Supplementary Information (ESI)

Nano-sized Mn oxide as a true catalyst for alcohol oxidation

by a mononuclear manganese(II) complex

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Sample Details						
Sample Name:	1:1 2					
SOP Name:	cellulose.sop					
General Notes:						
File Name:	cellulose.dts		Dispersant Na	me: Water		
Record Number:	Record Number: 239 Dispersant RI: 1.330 Material RI: 1.33 Viscosity (cP): 0.8872					
Material RI:						
Material Absorbtion:	0.900 Measurement Date and Time: Thursday, December 18, 20					
System						
Temperature (°C): 24.9 Duration Used (s): 60				(s): 60		
Count Rate (kcps):	172.6	Measur	ement Position (n	1m): 1.25		
Cell Description:	Glass cuvette w	ith square ap	er Attenua	ator: 4		
Results						
			Size (d.nm):	% Intensity	Width (d.n	
Z-Average (d.nm):	3629	Peak 1:	1060	100.0	102.4	
Pdl:	0.781	Peak 2:	0.000	0.0	0.000	
Intercept:	0.969	Peak 3:	0.000	0.0	0.000	
Result quality :	Refer to quali	ty report				
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Sample Details					
Sample Name:	1:1 2				
SOP Name:	cellulose.sop				
General Notes:					
File Name:	cellulose.dts		Dispersant Na	me: Water	
Record Number:	239		Dispersan	t RI: 1.330	
Material RI:	1.33		Viscosity (cP): 0.8872	
Material Absorbtion:	0.900	Measure	ment Date and Ti	me: Thursday	, December 18, 20.
System					
Temperature (°C):	24.9		Duration Used	(s): 60	
Count Rate (kcps):	172.6	Measur	ement Position (n	1m): 1.25	
Cell Description:	Glass cuvette wi	ith square	Attenua	tor: 4	
Results					
			Size (d.nm):	% Number	Width (d.nm
Z-Average (d.nm):	3629	Peak 1:	1054	100.0	148.3
Pdl:	0.781	Peak 2:	0.000	0.0	0.000
Intercept:	0.969	Peak 3:	0.000	0.0	0.000
Result quality :	Refer to quali	ty report			
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0.1	I	Size	(d.nm)	1000	10000
	Record	238: 1:1 1	Record 23	9: 1:1 2	



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Fig. S1. The DLS result from mixing **1** (1 mL, 4.21 mM), benzyl alcohol (0.25 mL) and Oxone (1 mL, 81 mM) in water after 10 minutes.

Sample Details Sample Name: 1:2(oxidant 1) 2 SOP Name: cellulose.sop **General Notes:** File Name: cellulose.dts Dispersant Name: Water Record Number: 243 Dispersant RI: 1.330 Material RI: 1.33 Viscosity (cP): 0.8872 Material Absorbtion: 0.363 Measurement Date and Time: Thursday, December 18, 201 System Temperature (°C): 24.9 Duration Used (s): 70 Count Rate (kcps): 165.7 Measurement Position (mm): 1.25 Cell Description: Glass cuvette with square aper... Attenuator: 4

Results

			Size (d.nm):	% Intensity	Width (d.n
Z-Average (d.nm):	4897	Peak 1:	1242	100.0	94.50
Pdl:	0.393	Peak 2:	0.000	0.0	0.000
Intercept:	1.01	Peak 3:	0.000	0.0	0.000
Result quality :	Refer to quality	report			



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Sample Details							
Sample Name:	1:2(oxidant 1) 2						
SOP Name:	cellulose.sop						
General Notes:							
File Name:	cellulose.dts		Dispersant Na	me: Water			
Record Number:	243		Dispersan	t RI: 1.330			
Material RI:	1.33		Viscosity (cP): 0.8872			
Material Absorbtion:	0.363	0.363 Measurement Date and Time: Thursday, December 18, 2					
System							
Temperature (°C):	24.9		Duration Used	l (s): 70			
Count Rate (kcps):	165.7	Measur	rement Position (r	nm): 1.25			
Cell Description:	Glass cuvette wit	h square	Attenua	ator: 4			
Results							
			Size (d.nm):	% Number	Width (d.nm		
Z-Average (d.nm):	4897	Peak 1:	1238	100.0	160.4		
Pdl:	0.393	Peak 2:	0.000	0.0	0.000		
Intercept:	1.01	Peak 3:	0.000	0.0	0.000		
Result quality :	Refer to qualit	y report					
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0.1	1	10	100 (d.nm)	1000	10000		
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	Record 2/2: 1:2/ov	idant 1) 1	Becord 24	3: 1:2(ovident 1) 2			
	1.2(0)		Necold 24	5. 1.2(0x/udit(1) 2			



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Fig. S2. The DLS result from mixing 1 (1 mL, 4.21 mM), benzyl alcohol (0.25 mL) and Oxone (2 mL, 81 mM) in water minutes.

Sample Details

Sample Nam	e: 1:2(oxidant 2	2) 2					
SOP Nam	e: cellulose.sop)					
General Note	s:						
File Nam	e: cellulose.dts		Dispersant Na	me: Water			
Record Numbe	r : 245		Dispersan	t RI: 1.330			
Material F	II: 1.33		Viscosity (cosity (cP): 0.8872			
Material Absorbtio	n: 0.900	Measur	ime: Thursday,	December 18, 201			
/stem							
Temperature (°C): 25.0		Duration Used	l (s) : 60			
Count Rate (kcps): 174.5	Measur	ement Position (n	1m): 4.65	1.65		
Cell Descriptio	n: Glass cuvett	e with square ap	er Attenua	ator: 6			
esults							
			Size (d.nm):	% Intensity	Width (d.n		
Z-Average (d.nm	i): 4045	Peak 1:	1936	100.0	237.2		
Po	II: 0.430	Peak 2:	0.000	0.0	0.000		
Intercep	ot: 1.01	Peak 3:	0.000	0.0	0.000		
Result quality	: Refer to qu	ality report					
		Size Distributio	n by Intensity				
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0.1	1	10	100	1000	10000		
		Size	e (d.nm)				
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	Record 244: 1	Record 244: 1:2(oxidant 2) 1 Record 245: 1:2(oxidant 2) 2					

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Sample	e Name:	1:2(oxidant 2	2) 2			
SO	P Name:	cellulose.sop)			
Genera	al Notes:					
Fil	e Name:	cellulose.dts		Dispersant Na	ame: Water	
Record I	Number:	245		Dispersar	nt RI: 1.330	
Mat	terial RI:	1.33		Viscosity	(cP): 0.8872	
Material Abs	orbtion:	0.900 Measurement Date and Time: Thursday, Decemb				
System						
Temperat	ure (°C):	25.0		Duration Used	i (s): 60	
Count Rate	e (kcps):	174.5	Measur	ement Position (r	nm): 4.65	
Cell Des	cription:	Glass cuvett	e with square	Attenua	ator: 6	
Results						
Counto				Size (d.nm):	% Number	Width (d.nm
Z-Average	(d.nm):	4045	Peak 1:	1914	100.0	310.2
	Pdl:	0.430	Peak 2:	0.000	0.0	0.000
Ir	ntercept:	1.01	Peak 3:	0.000	0.0	0.000
Result o	quality :	Refer to qu	uality report			
			Size Distribution	by Number		
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0.1		1	10	100	1000	10000
			Size	(d.nm)		
		-				
		Record 244: 1	:2(oxidant 2) 1	Record 24	5: 1:2(oxidant 2) 2	

Sample Details



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Fig. S3. The DLS result from mixing 1 (1ml, 4.21 mM), benzyl alcohol (0.25 mL) and Oxone ® tetrabutylammonium (2 mL, 26 mM) in acetonitrile after 10 minutes.





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Fig. S4. SEM image from mixing 1 (1 mL, 4.21 mM), benzyl alcohol (0.25 mL) and Oxone (2 mL, 81 mM) in water after 10 minutes (a-d). The centrifuged particles were washed carefully with solvent before considering by SEM.





Fig. S5. SEM image from mixing 1 (2 mL, 4.21 mM), benzyl alcohol (0.25 mL) and Oxone (1 mL, 81 mM) in water after 10 minutes (a,b). The centrifuged particles were washed carefully with solvent before considering by SEM.



Fig. S6. SEM image from mixing 1 (4 mL, 4.21 mM), benzyl alcohol (0.25 mL) and Oxone (0.5 mL, 81 mM) in water after 10 minutes. The centrifuged particles were washed carefully with solvent before considering by SEM (a,b).







d



e

Fig. S7. SEM image from mixing 1 (4ml, 4.21 mM), benzyl alcohol (0.25 mL) and Oxone ® tetrabutylammonium (0.5 mL, 26 mM) in acetonitrile after 10 minutes. The centrifuged particles were washed carefully with solvent before considering by SEM.