

## Direct conversion of cellulose into isosorbide over Ni doped NbOPO<sub>4</sub> catalysts in water

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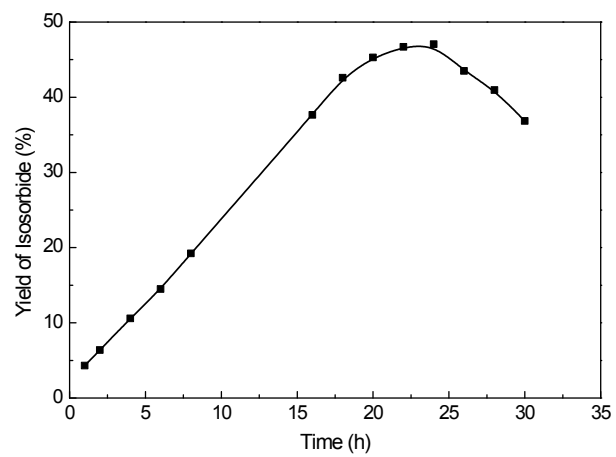
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**Fig. S1** Long-term running of the reaction under optimized reaction conditions.

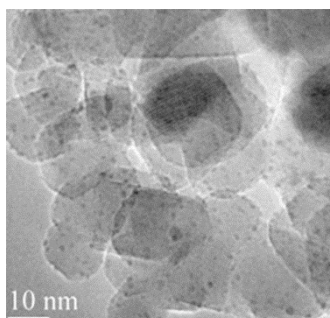
**Fig. S2** TEM images of 70Ni/NbOPO<sub>4</sub> after calcination in a H<sub>2</sub> atmosphere at 450 °C for 3 h.

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**Table S1** Conversion of cellulose over catalysts with different Ni loadings after 24 h (conditions: cellulose=0.5 g, Ni/NbOPO<sub>4</sub> = 0.5 g, 80 mL H<sub>2</sub>O, 3 MPa H<sub>2</sub>, 200 °C).

Ni loading (%)	Conversion (%)	Yield (%)				
		Isosorbide	Sorbitol	1,4-sorbitan	Mannitol	Glucose
10	40.86	5.07	0.97	1.07	3.2	1.9
20	71.23	21.76	0.63	2.25	4.02	1.34
30	88.97	30.73	6.26	6.76	4.88	0.37
40	95.33	33.69	7.03	5.77	5.03	0.48
50	98.94	35.13	7.42	6.93	6.85	0.67
60	100	36.47	7.01	7.24	7.34	0.94
70	100	47.19	9.86	5.55	8.29	0.11
80	100	42.63	9.73	8.98	8.8	0.86
90	100	42.97	8.88	7.07	7.62	0.46

**Table S2** Comparison of the current work with previous reports using Ru-based catalysts

Entry	material	Catalyst	Reaction conditions	Yield of isosorbide /%	References
1	cellulose	HCl + Ru/C	215°C, 6 MPa H <sub>2</sub> , 6h	49.5	18
2	wheat straw pulp	H <sub>4</sub> SiW <sub>12</sub> O <sub>40</sub> + Ru/C	210°C, 5 MPa H <sub>2</sub> , 1h	63	19
3	lignocellulosic	H <sub>4</sub> SiW <sub>12</sub> O <sub>40</sub> + Ru/C	210°C, 5 MPa H <sub>2</sub> , 5h	52	19
4	cellulose	Amberlyst 70 + Ru/C	190°C, 5 MPa H <sub>2</sub> , 6h	55.8	20
5	cellulose	Ru <sup>2.2</sup> /Fe <sub>3</sub> O <sub>4</sub> @void@PMO-SO <sub>3</sub> H <sup>0.43</sup>	220°C, 6 MPa H <sub>2</sub> , 2h	58.1	21
6	cellulose	Ru/NbOPO <sub>4</sub> -pH2 + NbOPO <sub>4</sub> -pH2	170°C, 4 MPa H <sub>2</sub> , 24h + 230°C, 18h	56.7	22
7	cellulose	Ru <sup>5.5</sup> @mNbPO	220°C, 6 MPa H <sub>2</sub> , 1h	52	23
8	ball-milled cellulose	Ni/NbOPO <sub>4</sub>	200°C, 3 MPa H <sub>2</sub> , 24h	47.2	this work