Supplementary Information

Separation of Short-chain Glucan Oligomers from Molten Salt Hydrate and Hydrolysis to Glucose

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Glucan oligomer separation from molten salt hydrate

Before the measurement, the hydrolysate obtained from cellulose hydrolysis in the MSH at 130 ^{o}C for 5 h went through a dialysis process in order to remove LiBr from the oligomer solution. 5 g of the hydrolysate obtained from molten salt hydrolysis was added into a 15 cm of a dialysis tube (T3, Cellu Sep). The tube was sealed with two plastic grips. The dialysis was performed in a 1000 mL glass breaker filled with deionized water under a magnetic stirring of 100 rpm. The dialysis was repeated for five times. After the dialysis, the solution inside the tube changed from yellow transparent solution to white flocculent precipitation. The precipitate was removed from the dialysis tube and further dried in a rotary evaporator at 60 ^{o}C.

1. Figures

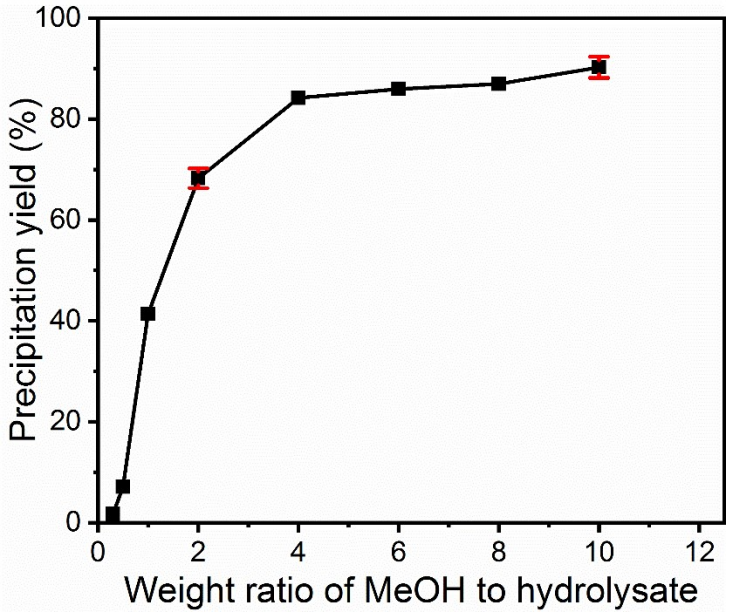

Figure S1. The effect of MeOH dosage on oligomer precipitation efficiency. Oligomer preparation: 100 mg of cellulose, 6 g of MSH,130 ^{o}C, 5 h;

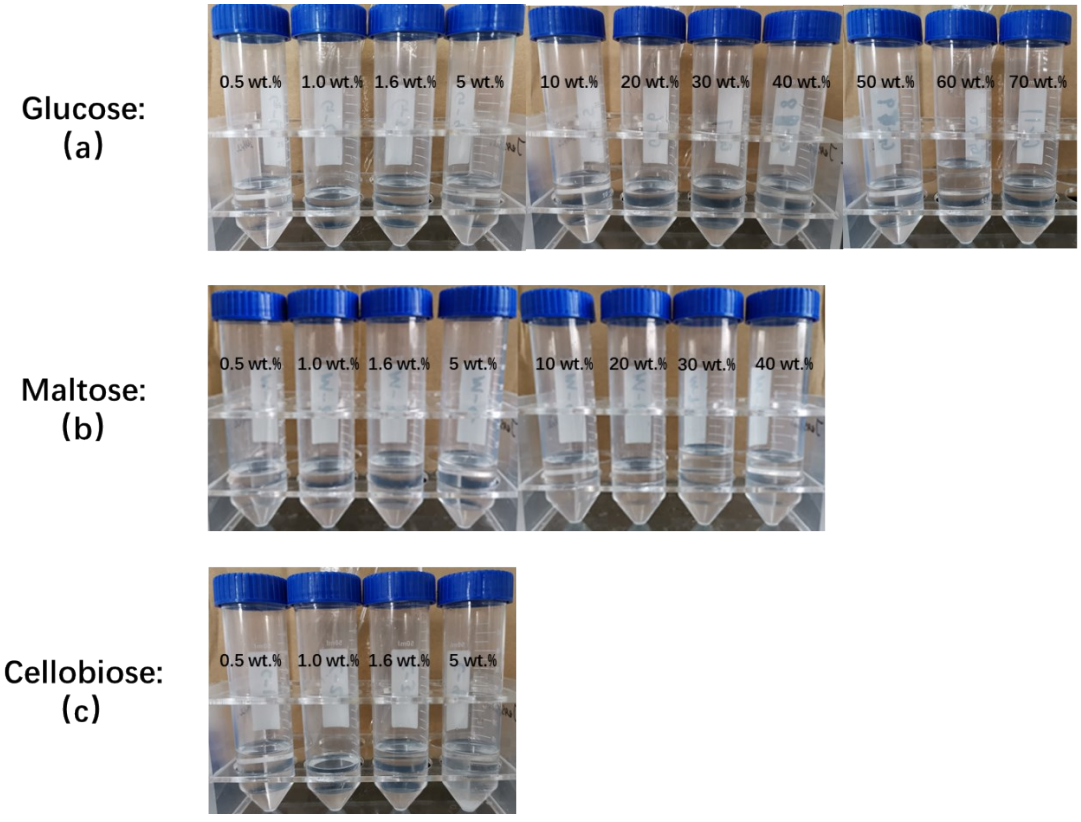

Figure S2. The morphologies of glucose, maltose and cellobiose precipitation from MSH with MeOH addition. Precipitation condition: 1 g of sugar solution mixed with 10 g of MeOH.

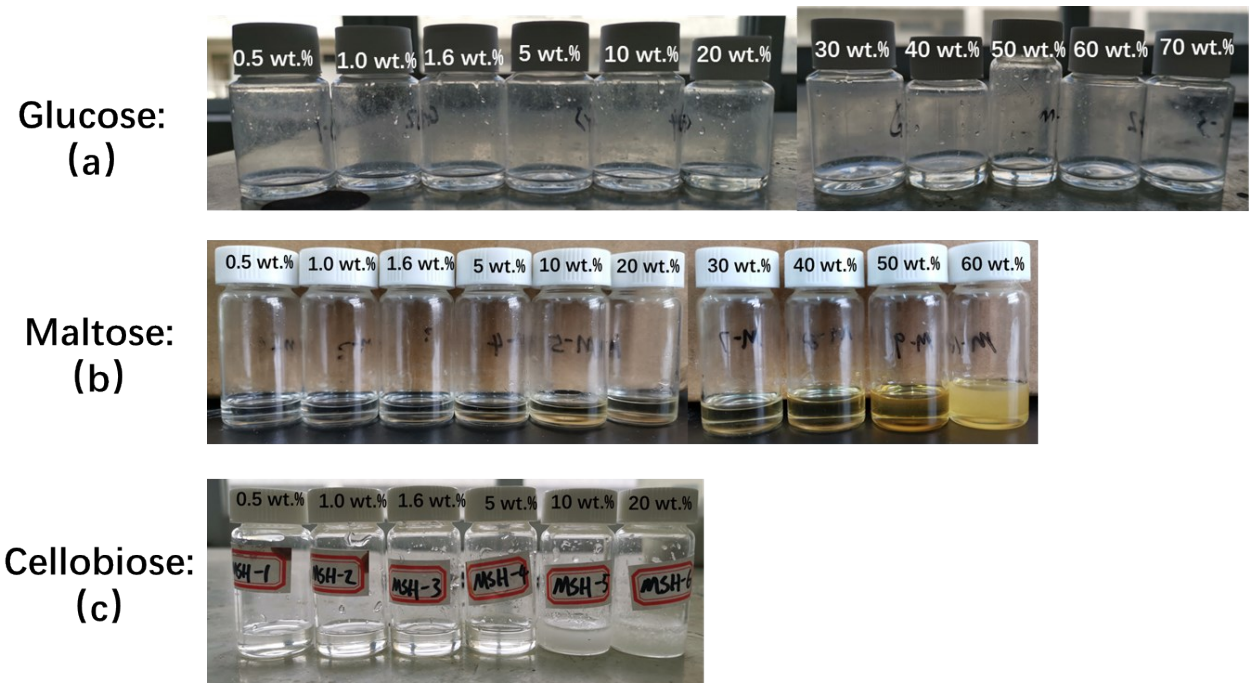

Figure S3. The morphologies of glucose, maltose and cellobiose dissolved in MSH with different concentration.

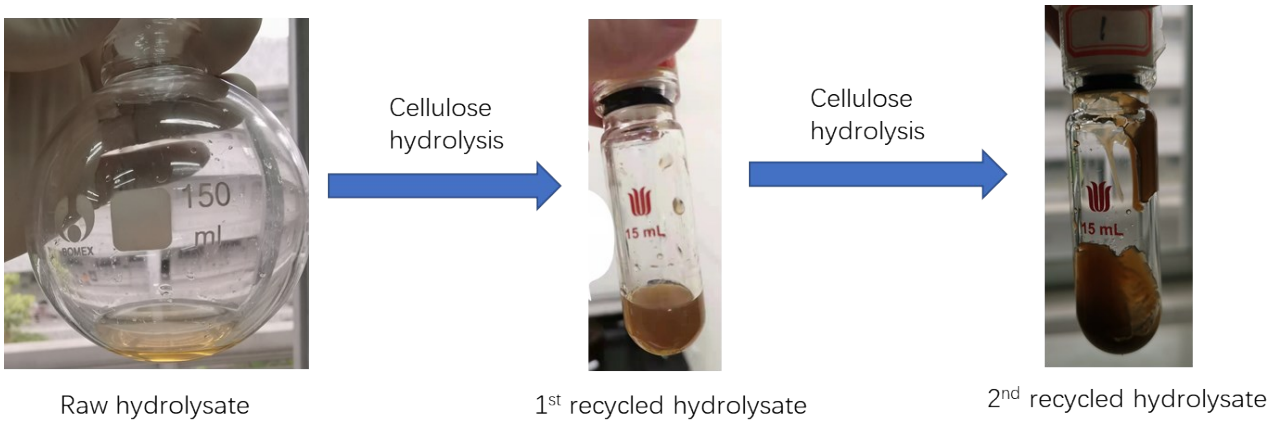

Figure S4. Morphology of MSH hydrolysates during each recycle.

Table S1 Precipitation yields of different sugar dissolved in MSH with MeOH addition [a]

Sugar Specie	Sugar Concentration (wt.%)	Precipitation yield (%)
Glucose	0.5	0
	1	0
	1.6	0
	5	0
	10	0
	20	0

	30	0
	40	0
	50	0
	60	0
	70	0
Cellobiose	0.5	0
	1	0
	1.6	0
	5	17.3
Maltose	0.5	0
	1	0
	1.6	0
	5	0
	10	10.4
	20	17.6
	30	29.2
	40	40.2
Oligomer	0.5	85.7
	1	89.8
	1.64	90.4

[a] Precipitation condition: 1 g of sugar solution mixed with 10 g of MeOH.

Table S2 Composition analysis of MSH hydrolysate [a] and recycled MSH [b]

Solution	Oligomer	Glucose	5-HMF	LA	FA
MSH hydrolysate	90.4%	3.4%	1.0%	0.9%	1.0%
Recycled MSH	8.8%	3.3%	0.9%	0.9%	1.0%

[a] MSH hydrolysate was prepared by hydrolyzing 100 mg of cellulose in 6 g of MSH at 130 ^{o}C for 5 h.

[a] Recycled MSH was obtained by precipitating glucan oligomer in hydrolysate with 10 times of MeOH followed by centrifugation to remove solid and evaporation to remove MeOH from MSH.