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Supporting Information

Simulated Moving Bed Chromatography: Separation and Recovery of Sugars and Ionic Liquid from Biomass Hydrolysates

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Table S1. Dependence of [BMIM]Cl recovery on its concentration

[BMIM]Cl Feed Concentration (mg/mL)	[BMIM]Cl Recovery in Raffinate (%)[a]
200	97
250	83
300	33
400	24

[a]Percent recovery refers to the recovered amount relative to the loaded amount.

Table S2. Dependence of [BMIM]Cl, glucose, and xylose recovery on extract flow rate

Extract Flow Rate (mL/min)	Sample	Recovered [BMIM]Cl (%)[a]	Recovered Glucose (%)[a]	Recovered Xylose (%)[a]
1.3	Raffinate	98	31	13
1.3	Extract	2	69	87
1.4	Raffinate	97	27	0
1.4	Extract	3	73	100
1.5	Raffinate	89	0	0
1.5	Extract	11	100	100
1.6	Raffinate	65	0	0
1.6	Extract	35	100	100

[a]Percent recovery refers to the recovered amount relative to the loaded amount.

Table S3. Yield of glucose and xylose from acid hydrolysis of biomass in recycled [BMIM]Cl

Stage	[HCl] (M)	Glucose Molar Yield (%)[a]	Xylose Molar Yield (%)[a]
1	8	18	66
2	8	3	5
1	12	12	40
2	12	8	12

[a]Yields are based on HPLC analysis and are relative to glucose and xylose monomers in corn stover.

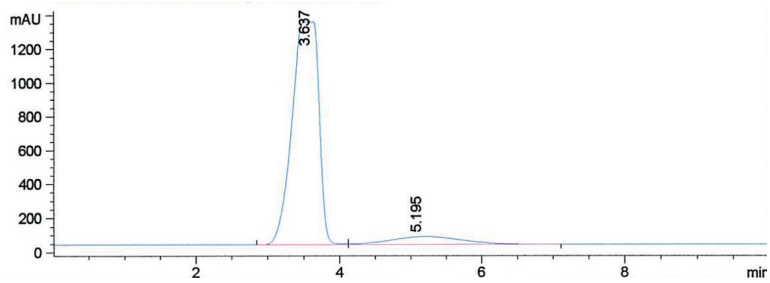

Figure S1. Single-column separation of [BMIM]Cl and glucose. A mixture of [BMIM]Cl and glucose was injected onto a Dowex® 50WX4-400 ion exclusion column. The column was eluted with deionized water at 2 mL/min at ambient temperature.

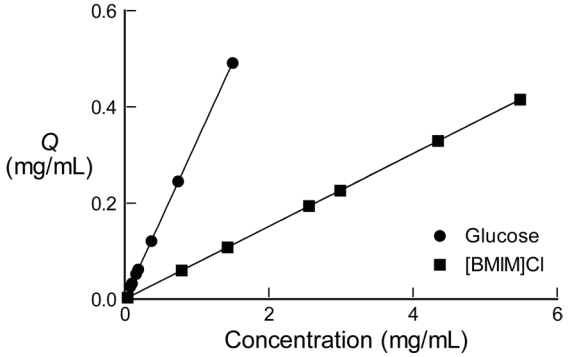

Figure S2. Adsorption isotherm of [BMIM]Cl and glucose.

Development Column Volume:	19.63
Flow Rate for t_0 ml/min:	2
t_0 min:	3.1
Void Fraction of Adsorbent:	0.32
Fast Peak 1 T_r min:	3.64
Slow Peak 2 T_r min:	5.2
Henry Constant H_1:	0.08
Henry Constant H_2:	0.31
Selectivity (H_2/H_1):	3.89
SMBC Column Volume ml:	7.9
Extra Column Volume ml:	0.39

Scenario:	**1**	**2**	**3**	**4**
Switch Time, sec:	40	40	40	40
Q_{feed} ml/min:	0.25	0.25	0.25	0.25
$Q_{desorbent}$ ml/min:	4.5	4.5	4.5	4.5
$Q_{extract}$ ml/min:	1.3	1.4	1.5	1.6
$Q_{raffinate}$ ml/min:	3.45	3.35	3.25	3.15
$Q_{recycle}$ ml/min:	3.0	3.0	3.0	3.0
Q_1 ml/min:	7.50	7.50	7.50	7.50
Q_2 ml/min:	6.20	6.10	6.00	5.90
Q_3 ml/min:	6.45	6.35	6.25	6.15
Q_4 ml/min:	3.00	3.00	3.00	3.00
m_1:	**0.39**	**0.39**	**0.39**	**0.39**
m_2:	**0.23**	**0.22**	**0.21**	**0.19**
m_3:	**0.26**	**0.25**	**0.24**	**0.22**
m_4:	**0.26**	**–0.16**	**–0.16**	**–0.16**
Mass Balance, ml/min:	4.75	4.75	4.75	4.75

Figure S3. Representative example of an SMB chromatography parameter calculator worksheet for a three-zone configuration.

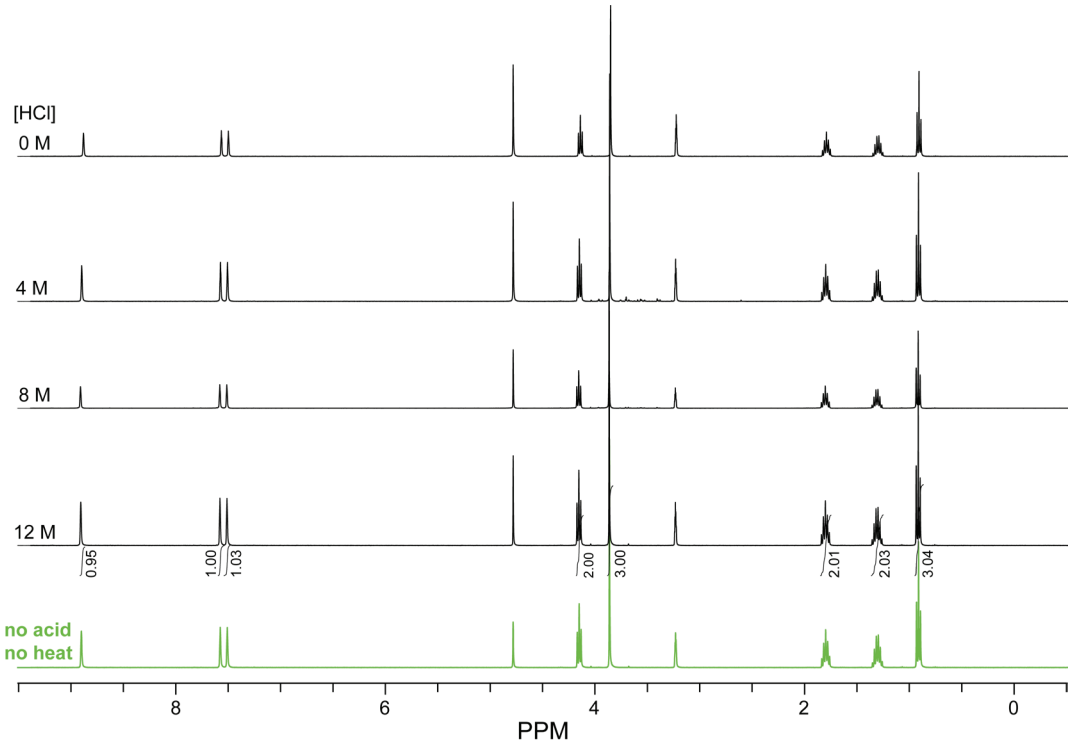

Figure S4. ^{1}H NMR spectra showing the effect of a 30-day exposure to hydrolysis reaction conditions (105°C) on the integrity of [BMIM]Cl.