Supporting Information

Two-step conversion of biomass-derived glucose with high concentration over Cu-Cr catalysts

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Table S1. One-step conversion of glucose over CuCr(4) catalyst with or without $Ca(OH)_2$

Entry	Substrates (30 wt%)	Reaction conditions	Conv. (%)	Yield (%)				
				1,2-PD	C2-4 [b]	C6 [c]	Oligos. [d]	Oth. [e]
1	Glucose [a]	493 K, 6MPa, 5h	Coking					
2	Glucose	493 K, 6MPa, 5h	Coking					
3	Glucose [a]	413 K, 6MPa, 5h	60.0	-	-	55.7	2.4	0.4
4	Glucose	413 K, 6MPa, 1h	90.4	11.7	22.1	9.0	50.1	4.1
5	Glucose	413 K, 6MPa, 2h	96.9	18.1	31.6	22.6	22.7	6.3
6	Glucose	413 K, 6MPa, 5h	>99.9	24.1	49.2	27.5	1.2	10.1

[a] without $Ca(OH)_2$; [b] C2-4: EG, 1,2-PD, GLY and ERY; [c] C6: SOR and MAN; [d] Water-soluble oligosaccharides; [e] Others: liquid (methanol, ethanol, propanol, furfuran and some unknown), gas (CO_2, CH_4, CO).

Table S2. Reaction results of glucose conversion in references

Concentration of glucose (%)	Catalyst	Reaction conditions	Yield (%)	References
50	Ni/Kieselguhr+ $CaCO_3$	220 ^{o}C,13.7 MPa	Y_{GLY}=43%	1
26	Os/AC+$Ba(OH)_2$	210 ^{o}C,5 MPa	$Y_{EG+1,2\text{-}PD}$ =46%	2
5	Ni_2P-W/AC+ $Ba(OH)_2$	200 ^{o}C,4 MPa	Y_{EG}=22%, $Y_{1,2\text{-}PD}$=12%	3
40	Ruthenium acetylacetonate	250 ^{o}C,13.7 MPa	Y_{EG}=10%, $Y_{1,2\text{-}PD}$=30%	4

Table S3. Surface elemental composition and various Cu oxidation species of fresh and used catalysts

	Atomic composition (%)					Composition (%)		
	Cu 2p	Cr 2p	O 1s	Ca 2s	Cu/Cr	Cu^0	Cu^+	Cu^{2+}
CuCr(4)	14.6	12.5	72.9		1.2			
CuCr(4)-R	20.2	14.4	65.4		1.4	47.1	24.2	28.7
CuCr(4)-RS	13.4	13.1	73.5		1.0	55.7	29.6	14.7
CuCrCa-S	11.5	12.0	74.0	2.5	1.0	45.4	42.3	12.3

Table S4. XPS analysis of various carbon oxide species on fresh and used catalysts

	Species	Binding energy (eV)	Composition (%)		
			CuCr(4)-R	CuCr(4)-RS	CuCrCa-S
Peak 1	Carbonyl (C=O)	288.1	7.3	4.3	5.9
Peak 2	Adventitious (C-C)	284.5	92.7	60.6	63.3
Peak 3	Alcohol or ether (C-OH or C-O-C)	285.7	0	35.1	30.8

References

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