



Title	Simultaneous formation of sorbitol and gluconic acid from cellobiose using carbon-supported ruthenium catalysts
Author(s)	Komanoya, Tasuku; Kobayashi, Hirokazu; Hara, Kenji; Chun, Wang-Jae; Fukuoka, Atsushi
Citation	Journal of Energy Chemistry, 22(2), 290-295 https://doi.org/10.1016/S2095-4956(13)60035-2
Issue Date	2013-03
Doc URL	http://hdl.handle.net/2115/53091
Type	article (author version)
Additional Information	There are other files related to this item in HUSCAP. Check the above URL.
File Information	Supplementary data_af130111_huscap.pdf



[Instructions for use](#)

Supplementary Data

Simultaneous formation of sorbitol and gluconic acid from cellobiose by carbon-supported ruthenium catalysts

Tasuku Komanoya ^{a,b}, Hirokazu Kobayashi ^{a,b}, Kenji Hara ^{a,b}, Wang-Jae Chun ^c,
Atsushi Fukuoka ^{a,b,*}

^a Catalysis Research Center, Hokkaido University, Kita 21 Nishi 10, Kita-ku, Sapporo, Hokkaido 001-0021, Japan

^b Division of Chemical Sciences and Engineering, Graduate School of Chemical Sciences and Engineering, Hokkaido University, Kita 13 Nishi 8, Kita-ku, Sapporo, Hokkaido 060-8628, Japan

^c Division of Arts and Sciences, International Christian University, 3-10-2 Osawa, Mitaka, Tokyo 181-8585, Japan

Table S1. Reuse experiment of Ru/BP2000 catalyst for cellobiose conversion.^a

Run	Yield (%C) ^b								Conv. (%)	Recovery of catalyst (%)
	Glu	Sor	Man	Col	Gla	Cac	Byp ^c	Total		
1	25	23 (9.7)	0.7	0.4	34 (15)	3.4	1.0	88	98	94
2	54	11 (4.7)	0.3	0.0	21 (9.0)	1.7	1.0	88	94	95
3	55	10 (4.5)	0.0	0.0	20 (9.1)	0.3	0.9	86	93	–

^a Cellobiose (205 mg), Ru/BP2000 (2 wt%, 150 mg), water (2.5 mL), 393 K, 16 h, 0.1MPa Ar. The recovered catalyst was washed with hot water/EtOH solution (50 mL, 50:50 vol/vol) and then reused after drying at 383 K. ^b Glu: glucose; Sor: sorbitol; Man: mannitol; Col: cellobitol; Gla: gluconic acid (equilibrium mixture with gluconolactone); Cac: cellobionic acid. Turnover numbers were shown in the parenthesis ^c Total amount of mannose, fructose and levoglucosan.

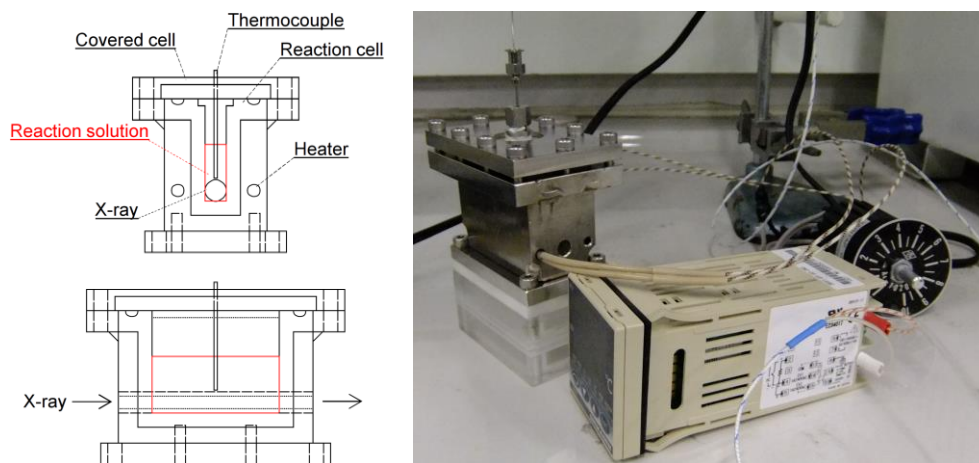


Figure S1. Reactor for the conversion of cellobiose.

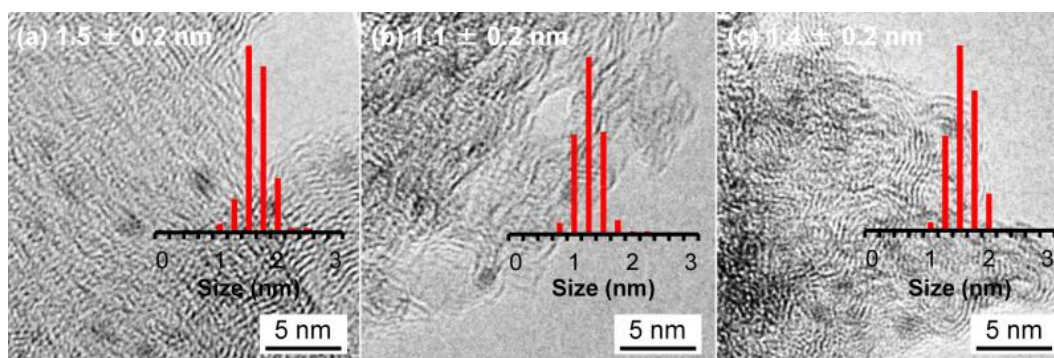


Figure S2. TEM images of (a) Ru/BP2000, (b) Ru/CMK-3, and (c) Ru/AC(N) catalyst.

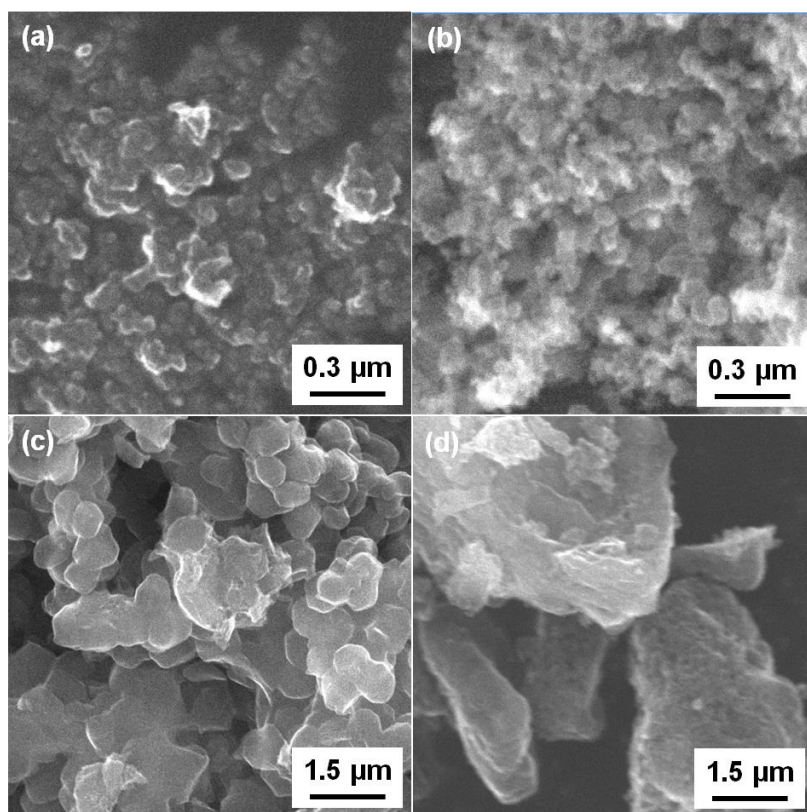


Figure S3. SEM images of (a) Ru/BP2000, (b) Ru/XC72, (c) Ru/CMK-3, and (d) Ru/AC(N) catalyst.