Supporting Information (SI)

Graphite Oxide- and Graphene Oxide-supported Catalysts for Microwave-assisted Glucose Isomerisation in Water

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Table S1. Binding energies reported in the literature.

XPS	Components	Symbols	Binding energies (eV)	References
O 1s	Chemisorbed H_2O or O_2		535.3	[1]
	Anhydride, lactone, carboxylic acids	O-C=O	533.3	[1]
	Hydroxyl, ethers, epoxy	C-OH, C-O-C	532.1-532.4	[1, 2]
	Al-OH hydroxyl	Al-OH	531.4-531.9	[3, 4]
	Carbonyl, quinone	C=O	530.7	[1]
	Al oxide	Al-O	530.4	[3]
C 1s	Carboxyl groups, esters, and lactones	O-C=O	288.4-290.4	[5, 6]
	Ketone, aldehyde	C=O	287	[7]
	Ether, epoxy	C-O-C	286.3	[7]
	Alcohol	C-OH	285.6	[7]
	Sp3-bonded carbon, adventitious carbon	C sp3, C-C, C-H	284.5-285	[8, 9]
	Sp2-bonded carbon	C sp2	284.4-284.8	[6, 7]
Al 2p	Alumina	Al_2O_3	75.8-76	[10, 11]
	Bayerite	β-$Al(OH)_3$	75	[4]
	Gibbsite, Al-O-C	γ-$Al(OH)_3$, Al-O-C	74.4	[4, 12]
	Boehmite	γ-AlO(OH)	73.9	[4]
	Metallic Al	Al	72.2-72.8	[10, 12]

References

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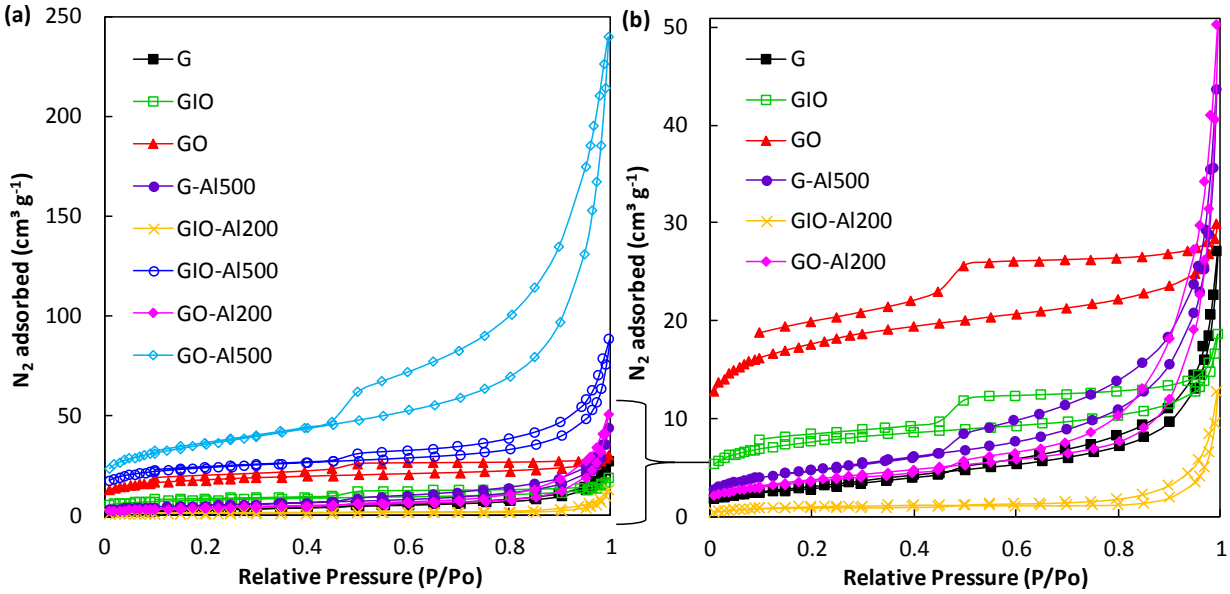

Figure S1. Nitrogen adsorption-desorption isotherms of the prepared samples.

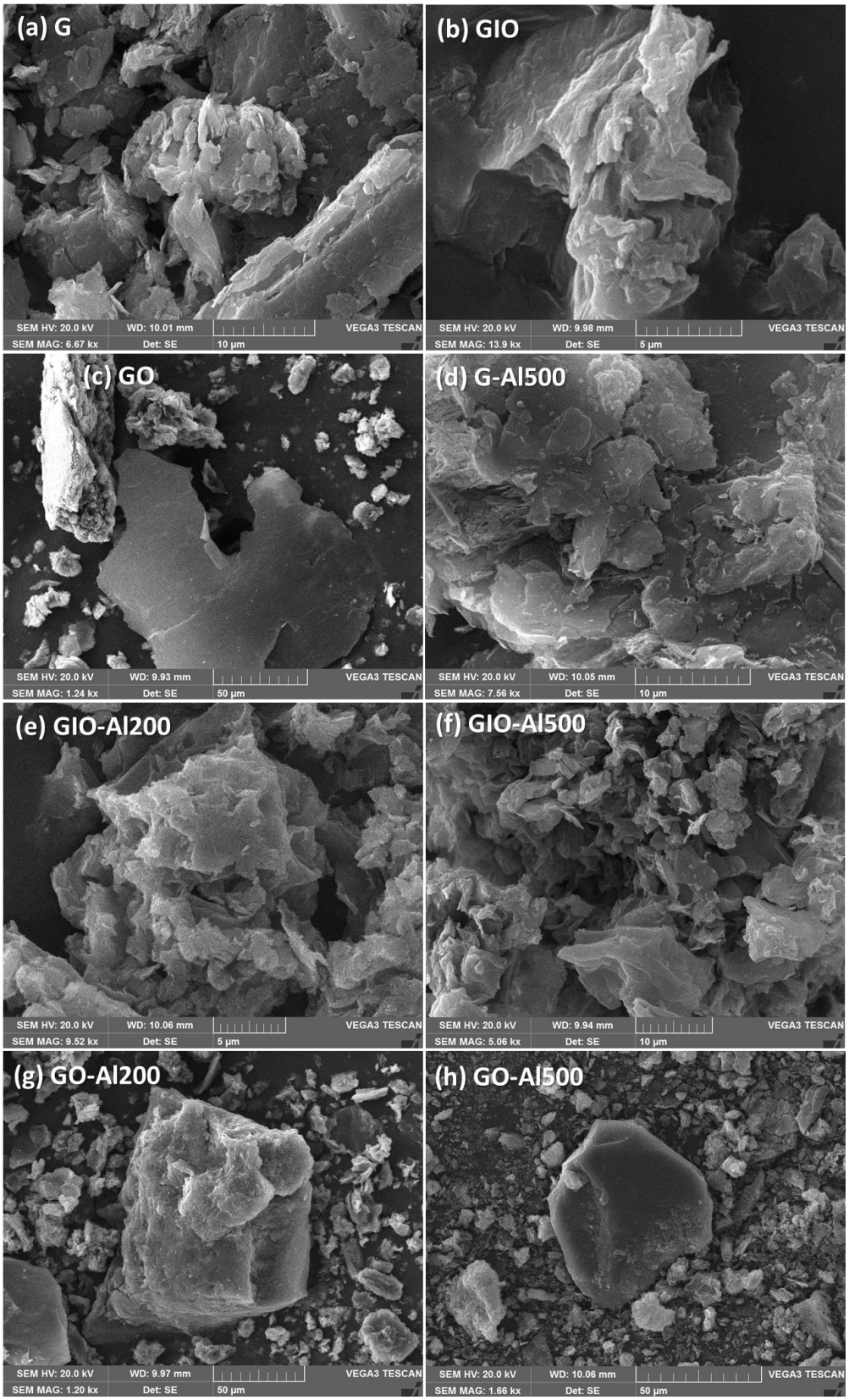

Figure S2. SEM images of the prepared samples.

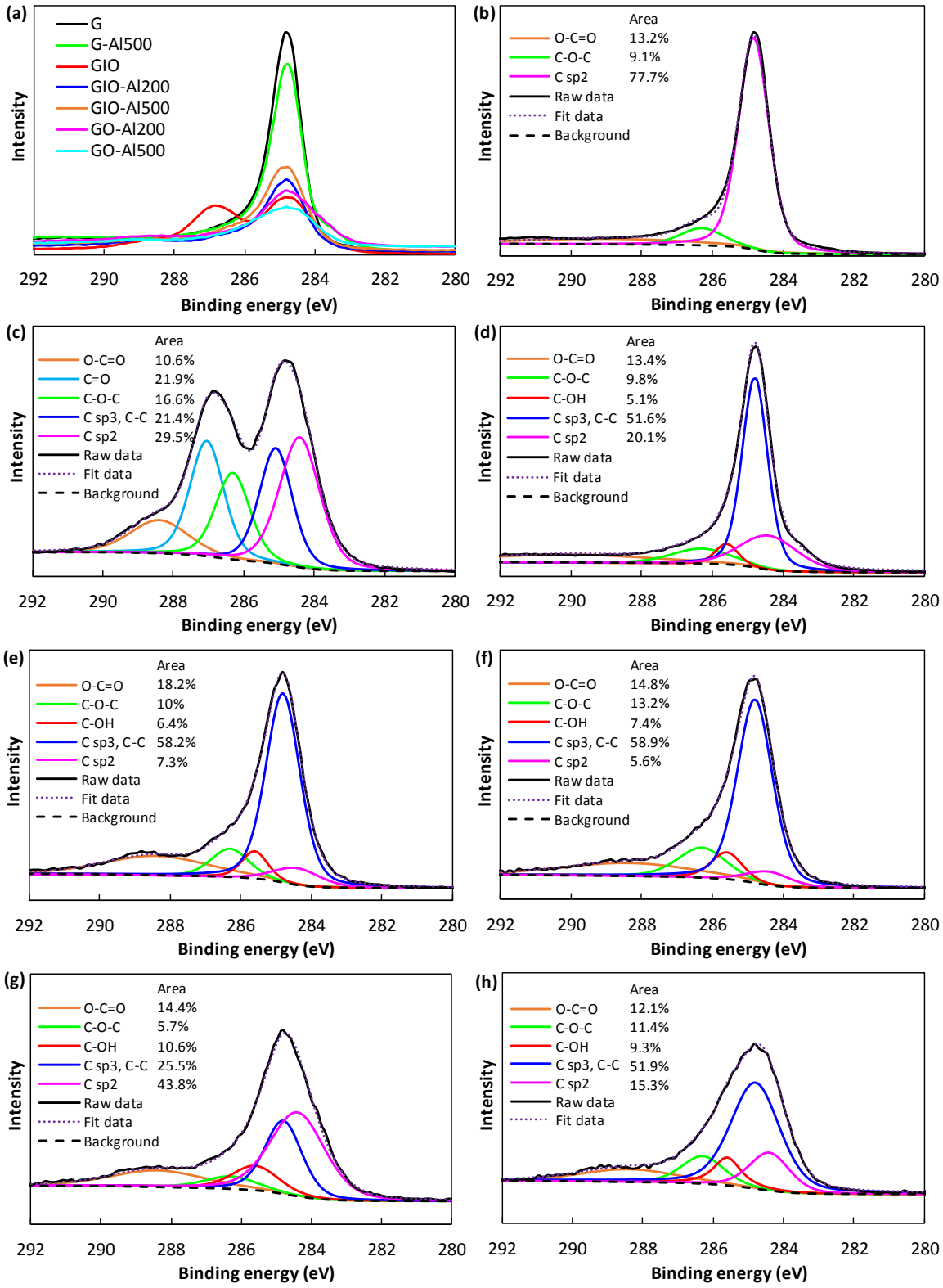

Figure S3. (a) C 1s XPS spectra of the prepared samples and curve fitting for the C 1s XPS spectra of (b) G, (c) GIO, (d) G-Al500, (e) GIO-Al200, (f) GIO-Al500, (g) GO-Al200, and (h) GO-Al500.

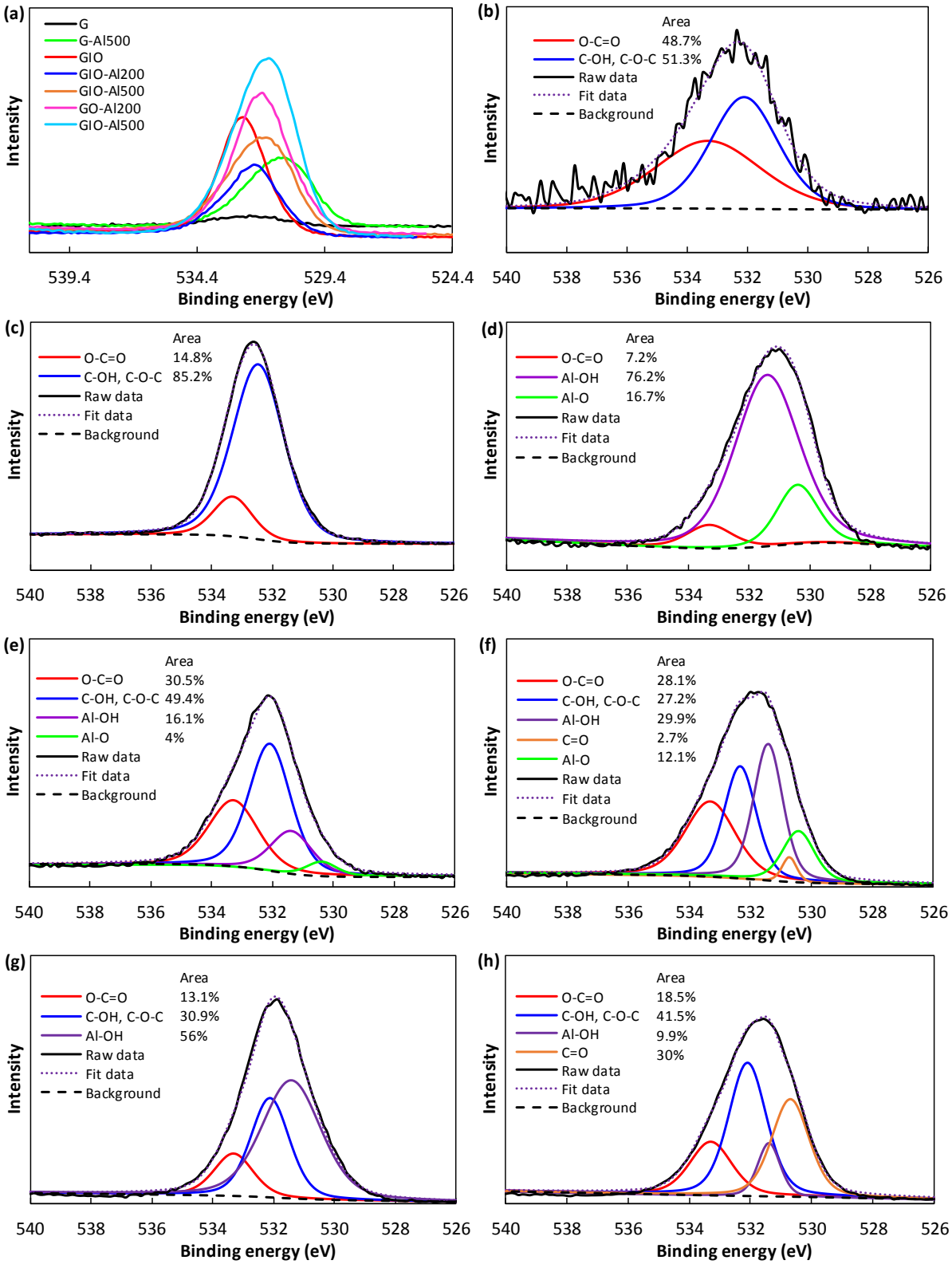

Figure S4. (a) O 1s XPS spectra of the prepared samples and curve fitting for the O 1s XPS spectra of (b) G, (c) GIO, (d) G-Al500, (e) GIO-Al200, (f) GIO-Al500, (g) GO-Al200, and (h) GO-Al500.

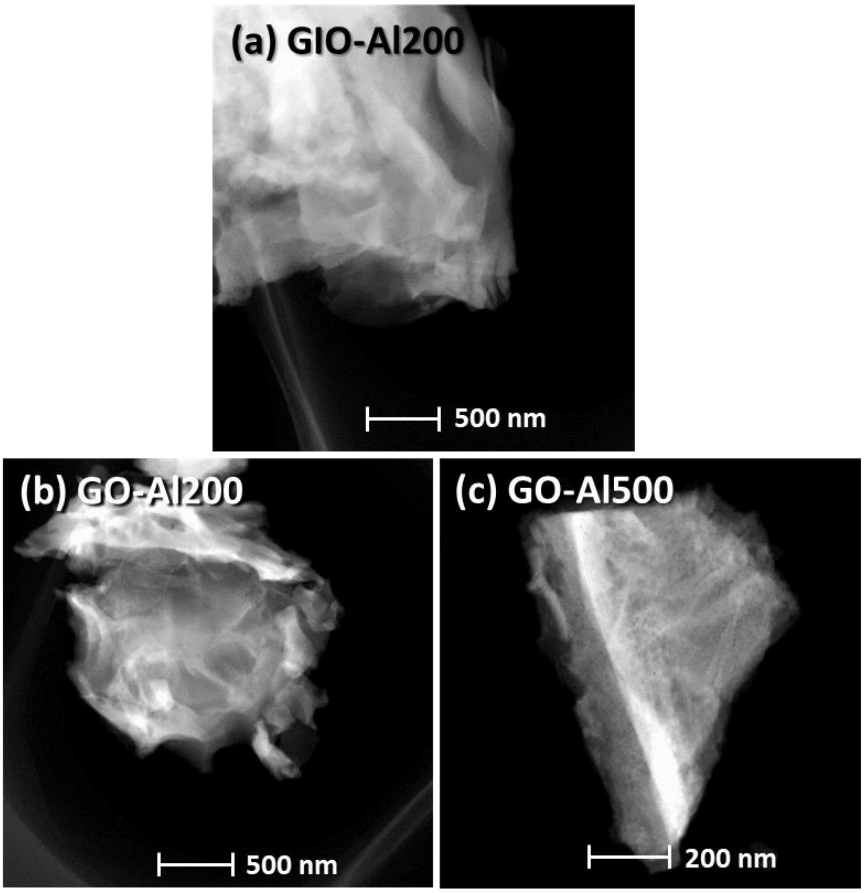

Figure S5. TEM images of (a) GIO-Al200, (b) GO-Al200, and (c) GO-Al500.

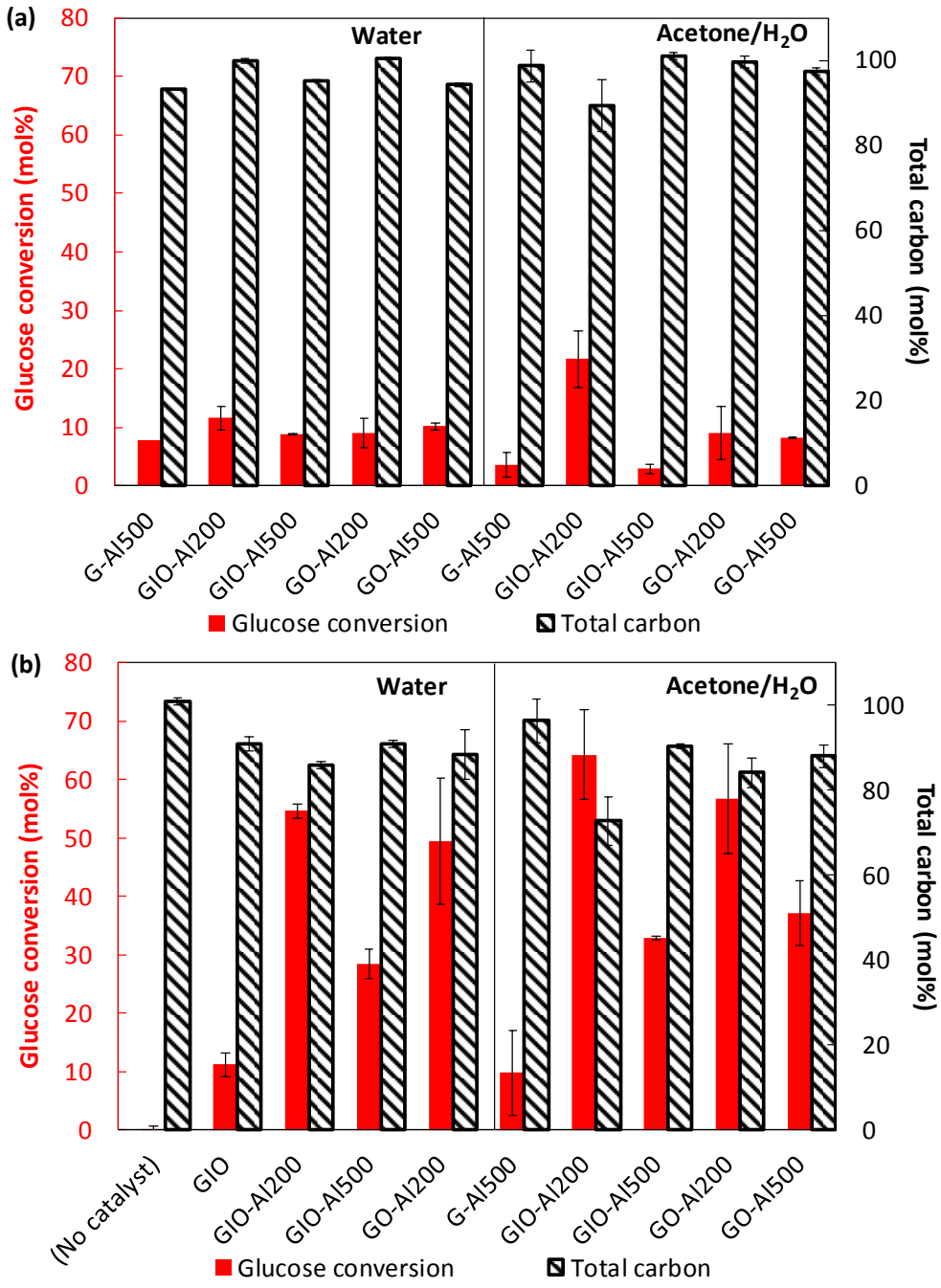

Figure S6. Glucose conversion and total carbon resulted from the catalytic conversion of glucose over different catalysts for (a) 1 min and (b) 20 min (conditions: 0.5 g glucose and 0.25 g catalyst in 10 ml water or acetone/H_2O (1:1 v/v) at 140 ^oC).

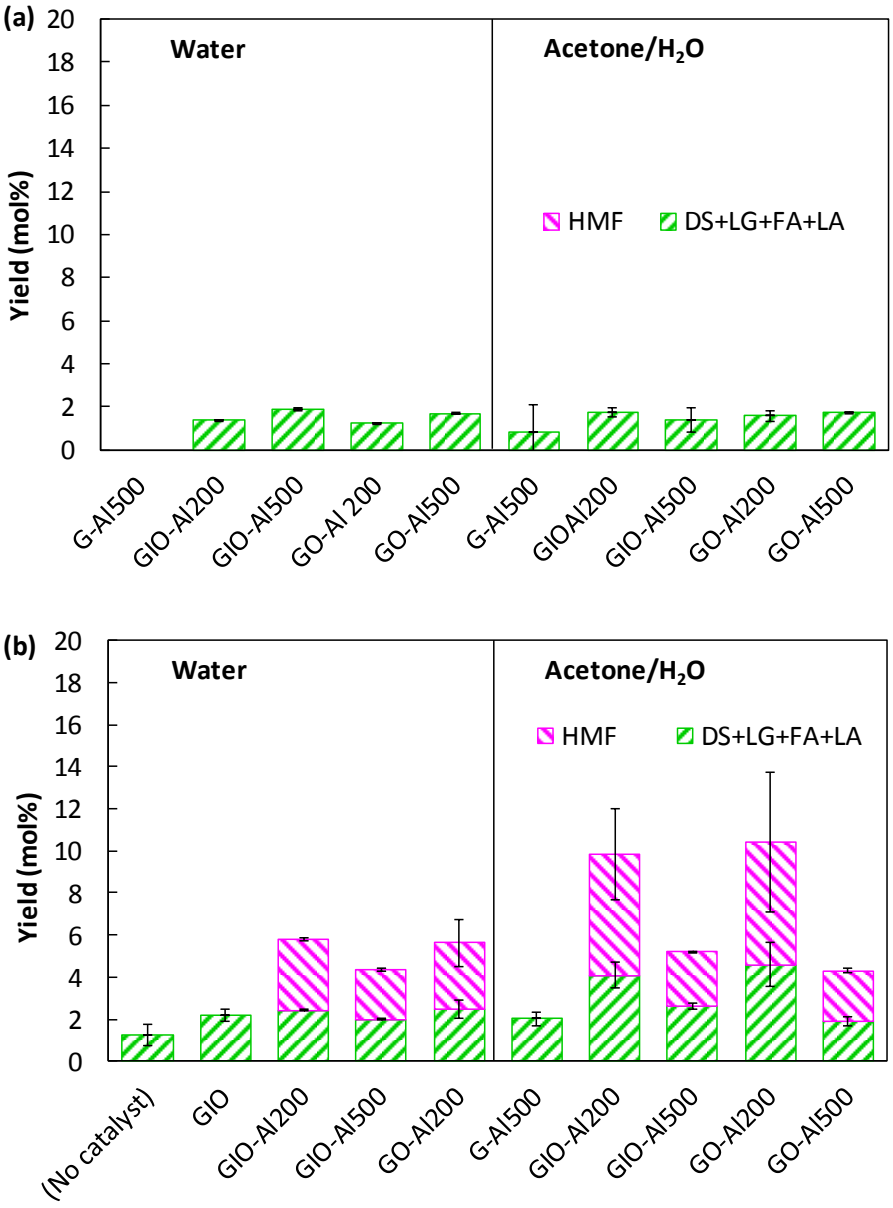

Figure S7. Yields of HMF, disaccharide (DS), levoglucosan (LG), levulinic acid (LA), and formic acid (FA) resulted from the catalytic conversion of glucose over different catalysts for (a) 1 min and (b) 20 min (conditions: 0.5 g glucose and 0.25 g catalyst in 10 ml water or acetone/H_2O (1:1 v/v) at 140 ^oC).

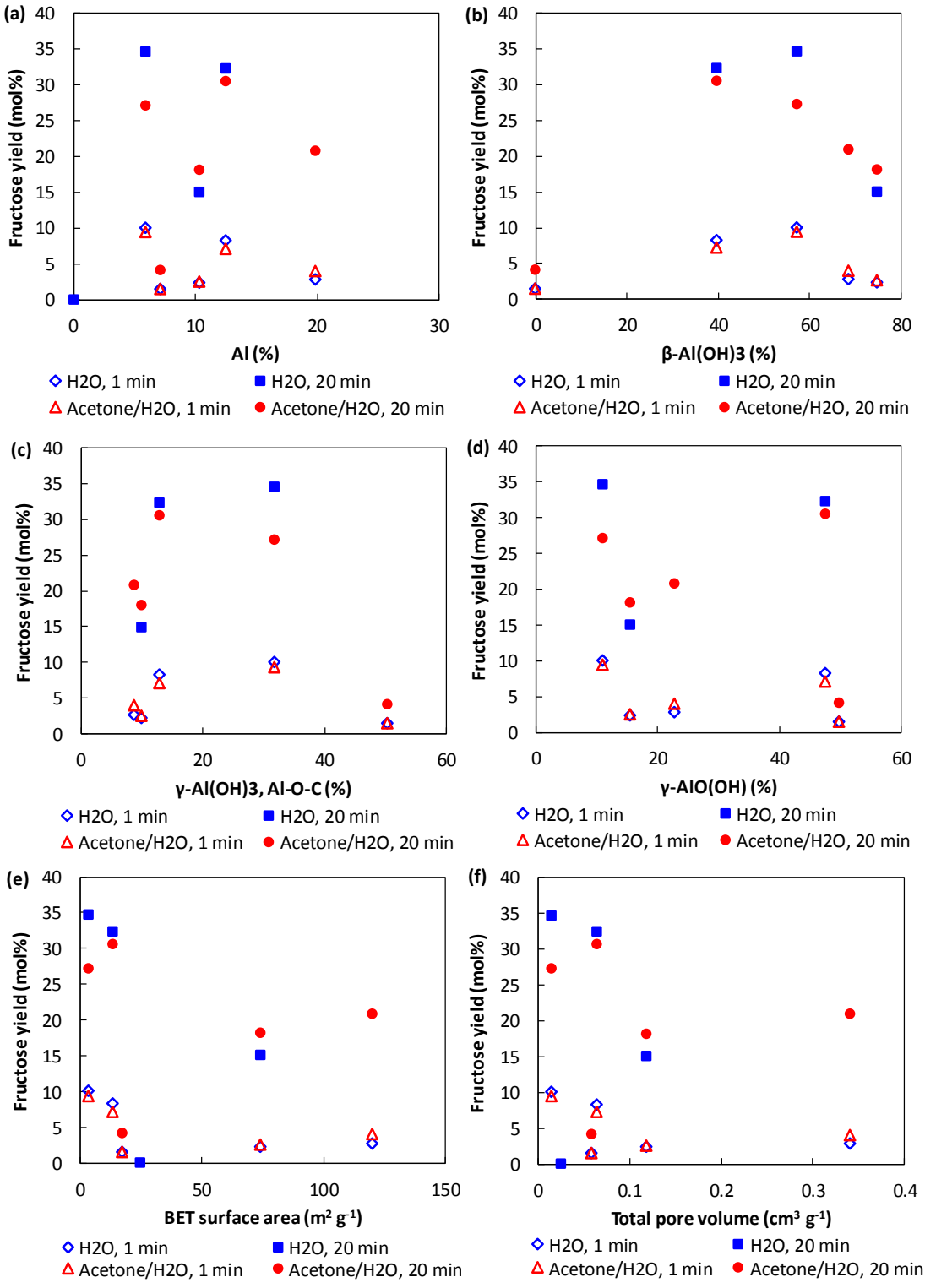

Figure S8. Fructose as a function of the (a) total Al content and (b-d) distribution of Al species suggested by XPS curve fitting, as well as (e) BET surface area and (f) total pore volume (conditions: 0.5 g glucose and 0.25 g catalyst in 10 ml water or acetone/H_2O (1:1 v/v) at 140 ^oC for 1 and 20 min).

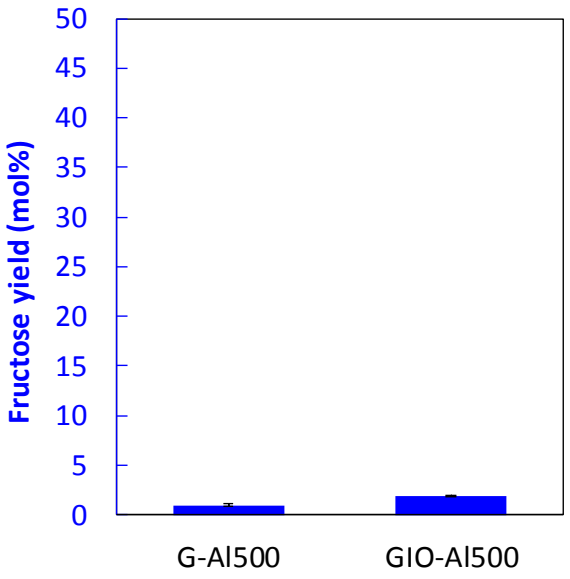

Figure S9. Fructose yield resulted from the catalytic conversion of glucose over different catalysts for 20 min at 140±3 ^{o}C in an oil bath (conditions: 0.5 g glucose and 0.25 g catalyst in 10 ml water).