

Supplement information

Tab. S1 Catalytic performance of 30Cu9.75MTS-500

Catalyst		30Cu9.75MTS-500		
Reaction time (h)		4	6	8
Conversion (%)	Methanol	29.30	16.64	\
	Ethanol	90.31	81.53	\
Selectivity (%)	AA	12.77	18.61	\
	PA	5.83	4.22	\
	IBA	10.66	1.69	\
	MA	1.23	0.60	\
	EA	9.13	5.58	\
	POL	1.49	1.75	\
	IBOL	2.49	1.37	\

Tab. S2 Gas composition in outlet over the 20C6.5MTS-400 after 6 h reaction

Outlet gas	H ₂	CO	CH ₄	CO ₂	C ₂	DME	MEOH	C ₃	C ₄₊
Volume fraction(%)	49.9	3.03	1.85	0	2.64	8.95	13.3	4.94	15.3

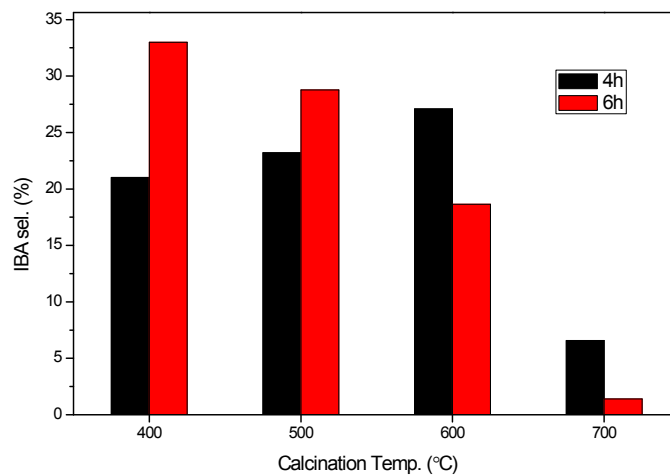


Fig. S1 IBA selectivity on the presentative catalysts in period of 4 and 6 h reaction, respectively.

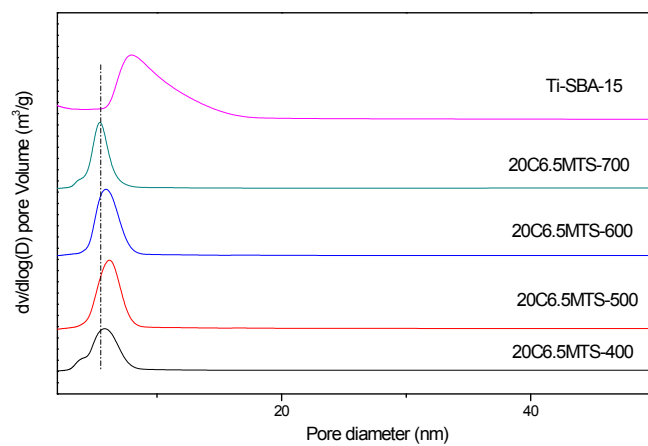


Fig. S2 Pore distribution of the representative catalysts calcined at different temperatures and Ti-SBA-15

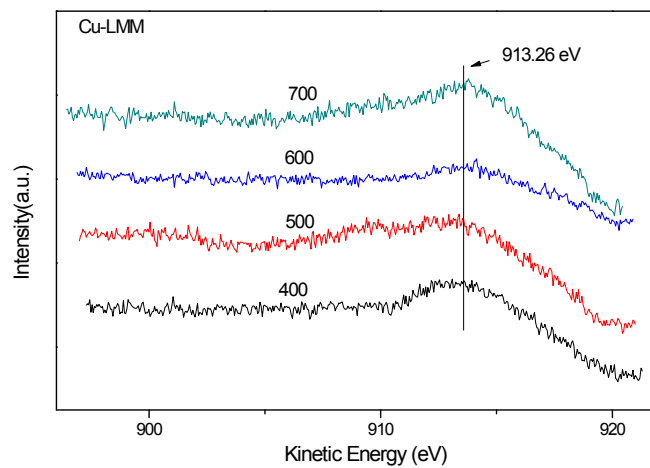


Fig. S3 Cu₂p auger electron spectroscopy of the representative catalysts