Green Chemistry

Electronic Supporting Information for

Sustainable Synthesis of Vinyl Methyl Ether from Biomass-derived Ethylene Glycol Dimethyl Ether over Solid Base Catalysts

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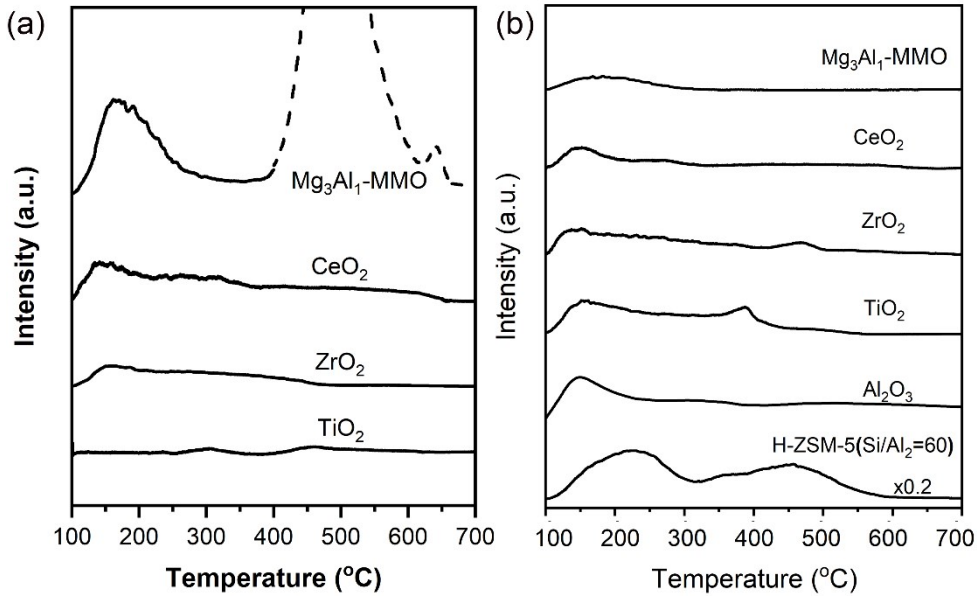

Fig. S1 (a) CO_2-TPD profiles of acid-base amphoteric catalysts [ZrO_2, TiO_2, Mg_3Al_1-MMO, and CeO_2]. It should be noted that the CO_2 desorption peak (dashed line) originated from the decomposition of carbonate. (b) NH_3-TPD profiles of acid-base amphoteric catalysts [ZrO_2, TiO_2, Mg_3Al_1-MMO, and CeO_2] and solid-acid catalysts [H-ZSM-5(Si/Al_2=60) and Al_2O_3].

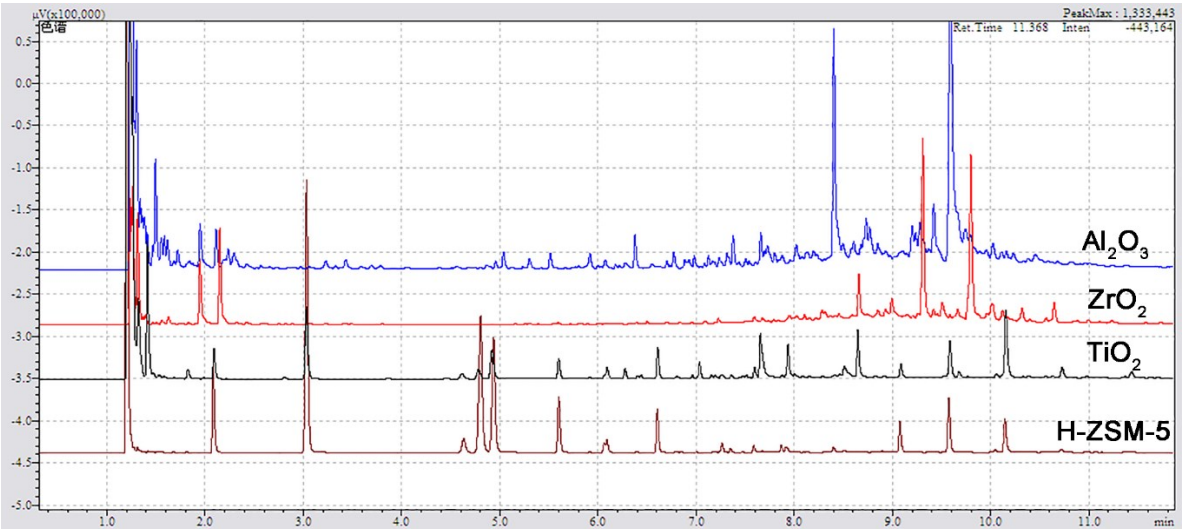

Fig. S2 GC spectra of the products from EGDE conversion on different catalysts (detected by FID detector).

Table S1 Conversion of VME on different catalysts [a]

Catalyst	Conversion of VME (%)
Blank	0
CaO	3.9
2-CaO-MgO	4.6

[a]Reaction conditions: 0.2 g catalyst, 400 °C, 2.9 kPa VME, N_2 balance, 30 mL·min^{-1}.

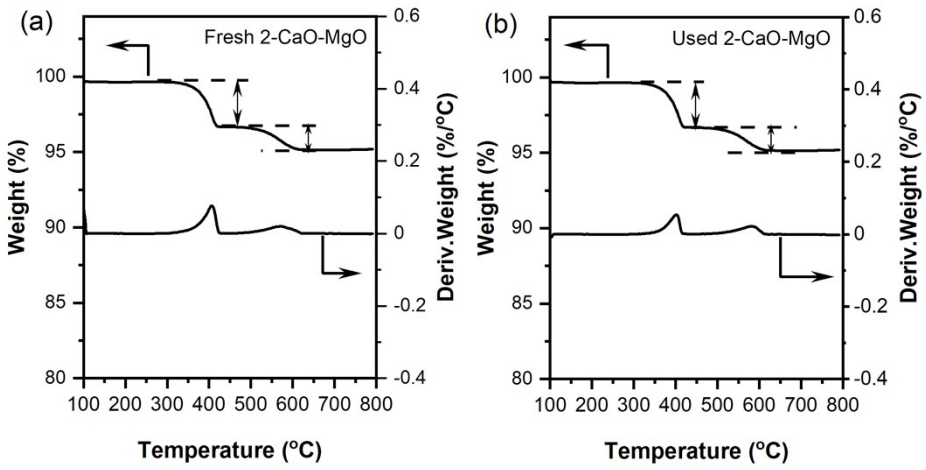

Fig. S3 TGA-DTG profiles of (a) fresh 2-CaO-MgO catalyst and (b) used 2-CaO-MgO catalyst after the EGDE reaction for 24 h. Reaction conditions: 400 °C, 3 kPa EGDE, N_2 balance, 30 mL·min^{-1}.

There is a 5% weight loss involving two distinct phases (350-420 °C and 550-620 °C), which are attributed to the decomposition of calcium hydroxide and calcium carbonate, respectively. It is worth noting that there is no significant difference between the fresh and used catalyst, indicating no carbon deposition was formed.