materials

MDPI

Article

A Kinetic Model Considering Catalyst Deactivation for Methanol-to-Dimethyl Ether on a Biomass-Derived Zr/P-Carbon Catalyst

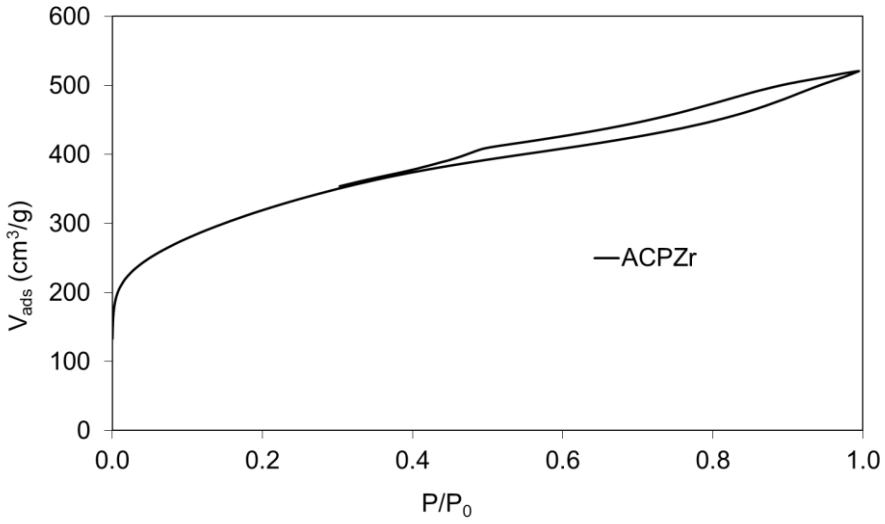

Figure S1. N2 adsorption-desorption isotherm at -196 °C of fresh catalyst.

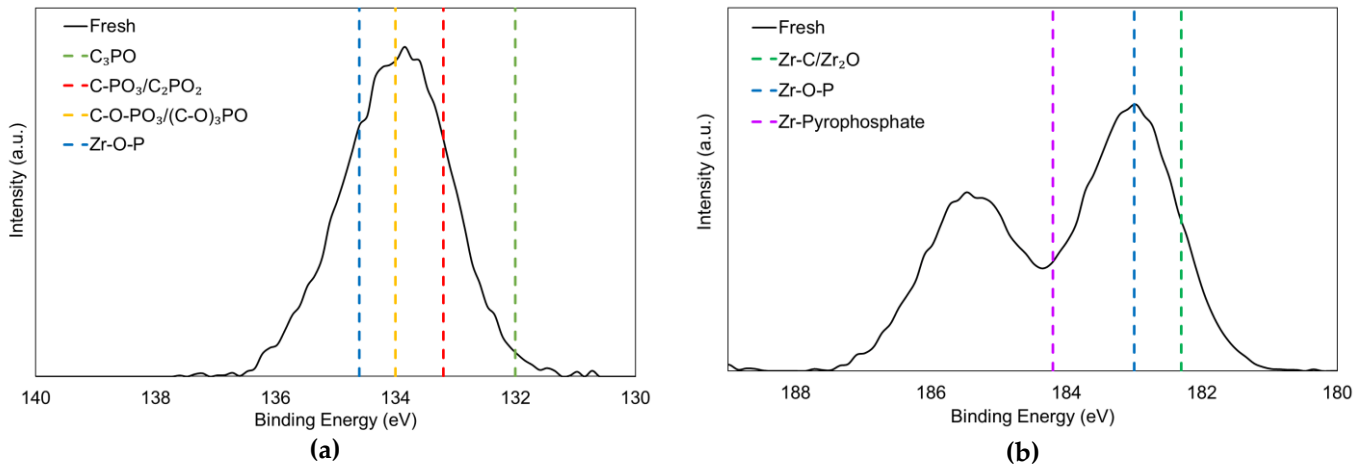

Figure S2. XPS spectra of (**a**) P2p and (**b**) Zr3d of fresh catalyst.

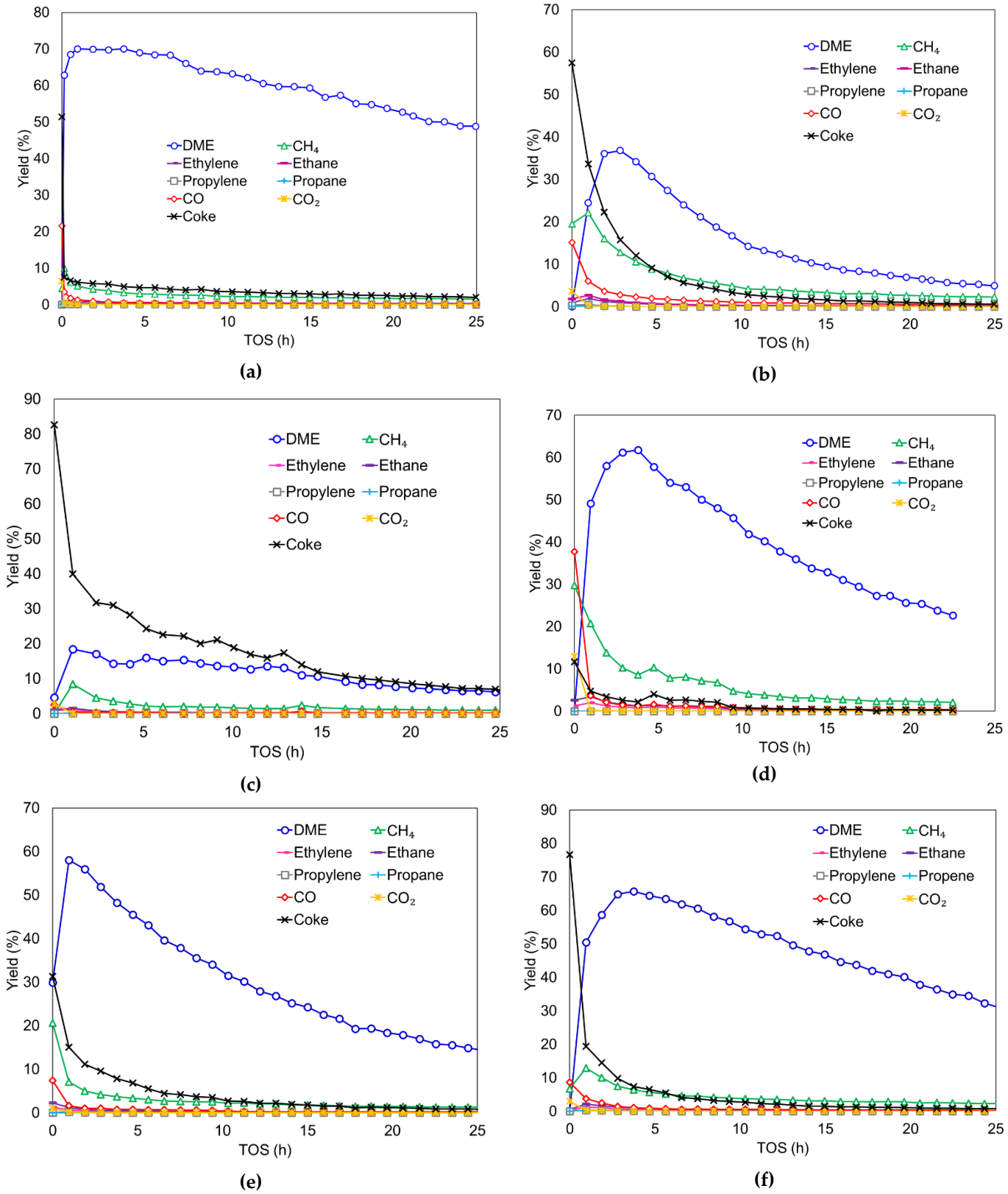

Figure S3. Yield to different products as a function of TOS at different operating conditions in the MTD reaction. (**a**) 450 °C, 0.04 atm_{CH_3OH} and 75 $g_{cat}/mmol_{CH_3OH}$ (**b**) 550 °C, 0.04 atm_{CH_3OH} and 75 $g_{cat}/mmol_{CH_3OH}$ (**c**) 500 °C, 0.015 atm_{CH_3OH} and 75 $g_{cat}/mmol_{CH_3OH}$ (**d**) 500 °C, 0.08 atm_{CH_3OH} and 75 $g_{cat}/mmol_{CH_3OH}$ (**e**) 500 °C, 0.04 atm_{CH_3OH} and 50 $g_{cat}/mmol_{CH_3OH}$ (**f**) 500 °C, 0.04 atm_{CH_3OH} and 100 $g_{cat}/mmol_{CH_3OH}$.

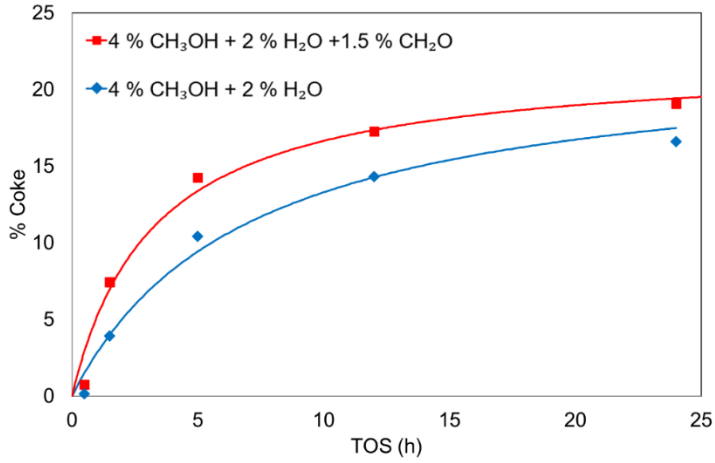

Figure S4. Coke content as a function of TOS for methanol + water fed and methanol + water + formaldehyde; temperature 500 °C and space time of 75 gcat·s/mmolCH3OH. Experimental data (**points**) and calculated (**lines**).