

## On the Mn promoted synthesis of higher alcohols over Cu derived ternary catalysts

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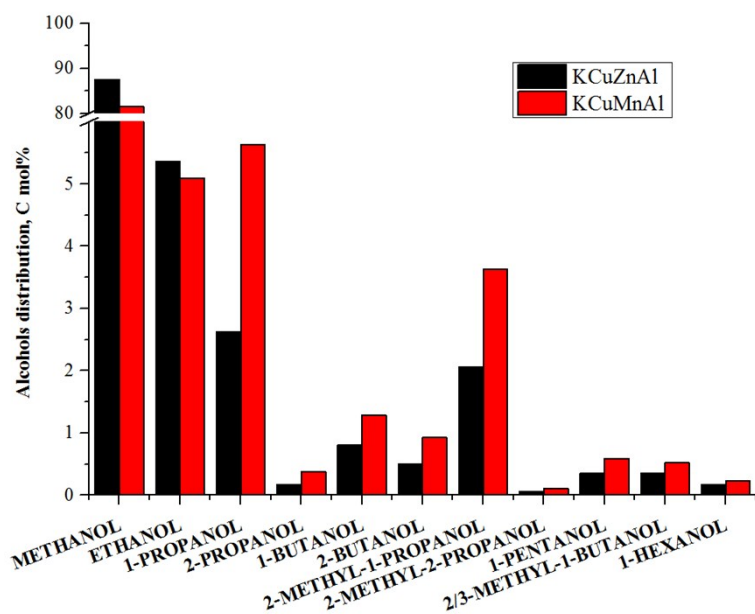
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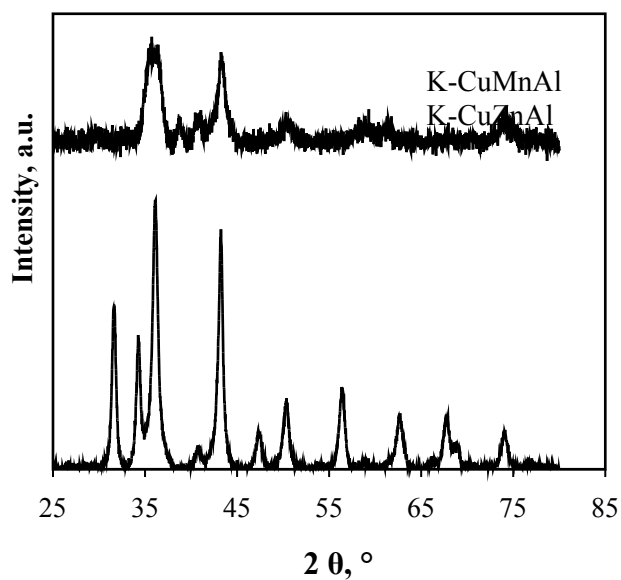
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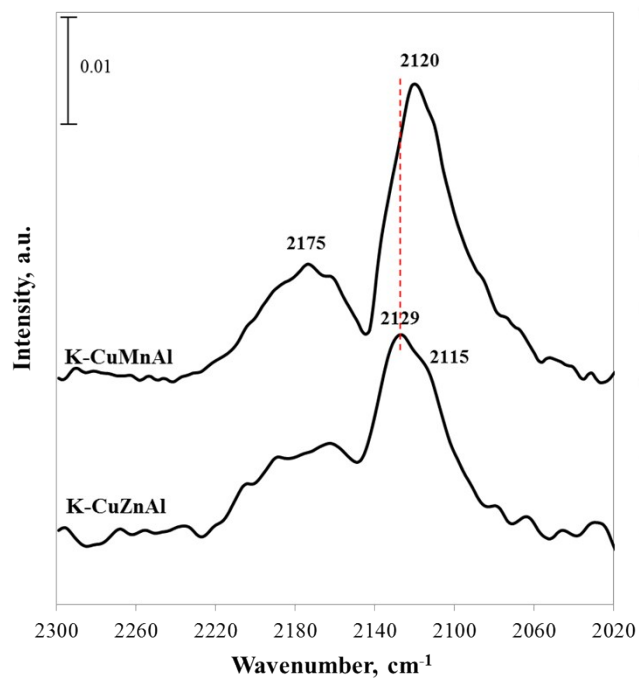
## Electronic supporting information



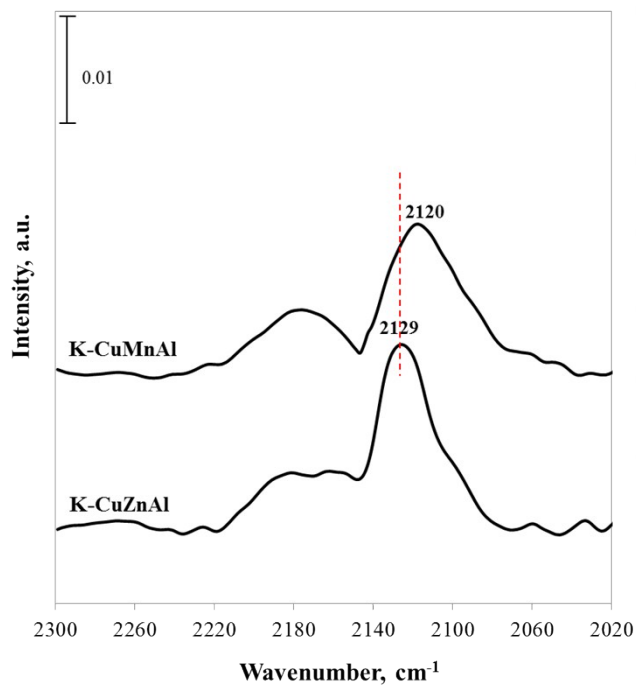
**Figure S1.** Distribution of alcohols over the K-CuZnAl and K-CuMnAl catalysts (Reaction conditions:  $T=300^{\circ}\text{C}$ ,  $P=40\text{bar}$ ,  $W/F=0.74\text{ g.s/cm}^3$ ,  $\text{H}_2/\text{CO}=2$ )



**Figure S2.** XRD of K-CuMnAl and K-CuZnAl samples following reduction at  $350^{\circ}\text{C}$  under  $\text{H}_2$



**Figure S3.** Steady-state in-situ DRIFTS spectra under 3% CO/He flow at 50°C after exposure for 15 min over K-CuZnAl and K-CuMnAl.



**Figure S4.** Steady-state in-situ DRIFTS spectra under 3% CO/6%  $\text{H}_2$ /He flow at 50°C after exposure for 15 min over K-CuZnAl and K-CuMnAl.