Supplementary material for

Tuning the Cu^+ species of Cu-based catalysts for direct synthesis of ethanol from syngas

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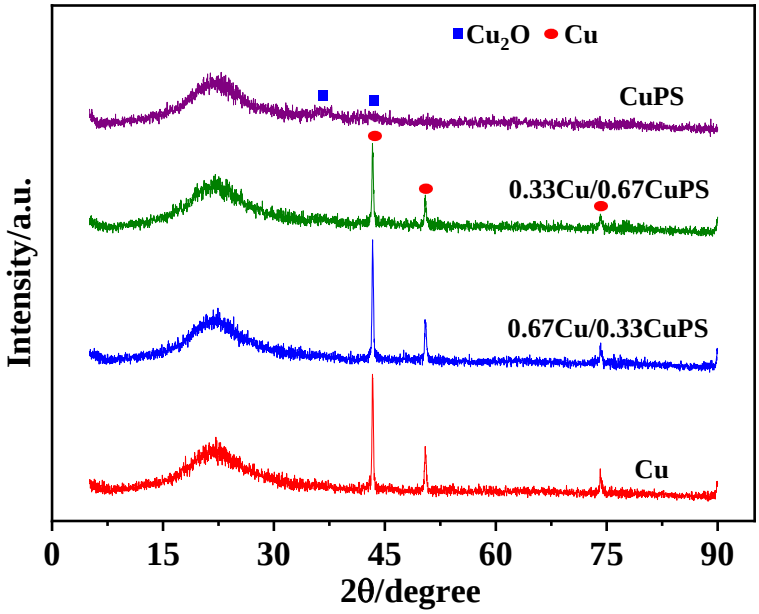

Fig. S1. XRD patterns of the spent catalysts.

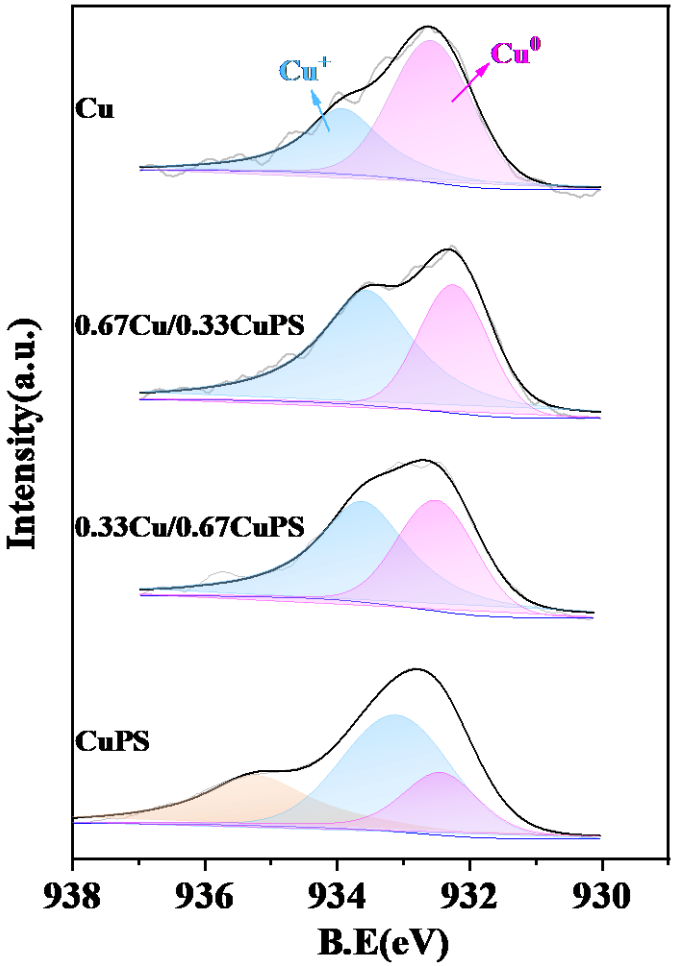

Fig. S2. Deconvoluted XPS spectra of Cu $2p_{3/2}$ of the reduced catalysts.

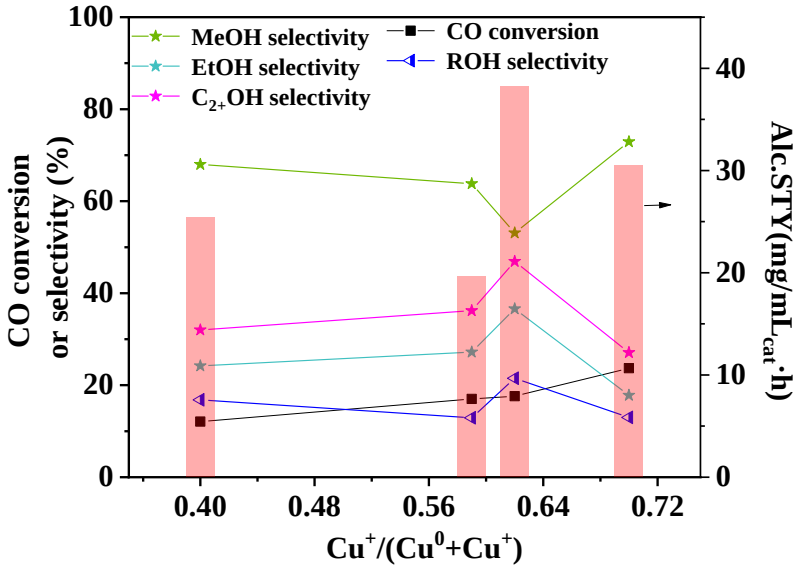

Fig. S3. The catalytic performance of xCu/yCuPS catalysts as a function of $Cu^{+}/(Cu^{+}+Cu^{0})$.

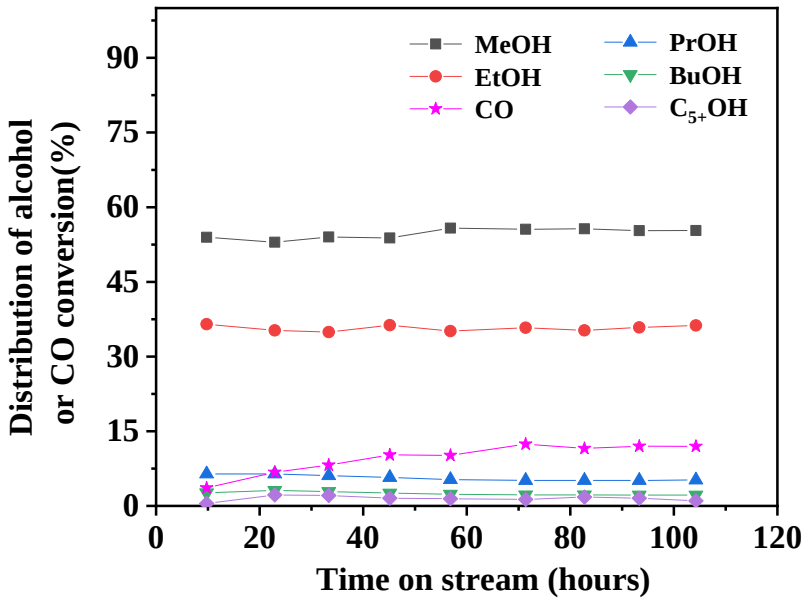

Fig. S4. CO conversion and alcohol distribution as a function of time on stream of the 0.33Cu/0.67CuPS catalyst at 300 °C and 5 MPa.