

Supplementary Materials

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Activation of Ethanol Transformation on Copper Containing SBA-15 and MnSBA-15 Catalysts by the Presence of Oxygen in the Reaction Mixture

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List of content:

Figure S1. XRD patterns of SBA-15 and MnSBA-15 materials before and after modification with copper. (A, B) The range of $0.6^{\circ} - 8^{\circ} 2\theta$; (C) The range of $30^{\circ} - 60^{\circ} 2\theta$.

Figure S2. Nitrogen adsorption/desorption isotherms of SBA-15 and MnSBA-15 materials before and after modification with copper.

Figure S3. FTIR spectra after (a) adsorption of pyridine at 423 K on MnSBA-15, Cu-MnSBA-15 and Cu-SBA-15 materials and desorption at (b) 423 K, (c) 473 K, (d) 523 K, (e) 573 K for 30 min at each temperature.

Figure S4. FTIR spectra recorded in ethanol flow at 593 K during 120 min for Cu-SBA-15 catalyst (4000-1300 cm^{-1} range).

Figure S5. FTIR spectra of catalysts in the hydroxyl groups region (4000-2500 cm^{-1}) after activation in argon flow at 623 K.

Figure S6. FTIR spectra recorded in argon flow at 473 K during 60 min for Cu-SBA-15 catalyst (4000-1300 cm^{-1} range).

Figure S7. The comparison of FTIR spectra recorded in ethanol and oxygen flow at 473 K for Cu-SBA-15 after activation in Ar or Ar+O₂ flow after 15, 30, 45 and 90 min of the reaction (4000-1300 cm^{-1} range).

Figure S8. The comparison of FTIR spectra recorded in ethanol flow at 473 K for Cu-SBA-15 after activation in Ar or Ar+O₂ flow after 15, 30, 45 and 90 min (4000-1300 cm^{-1} range).

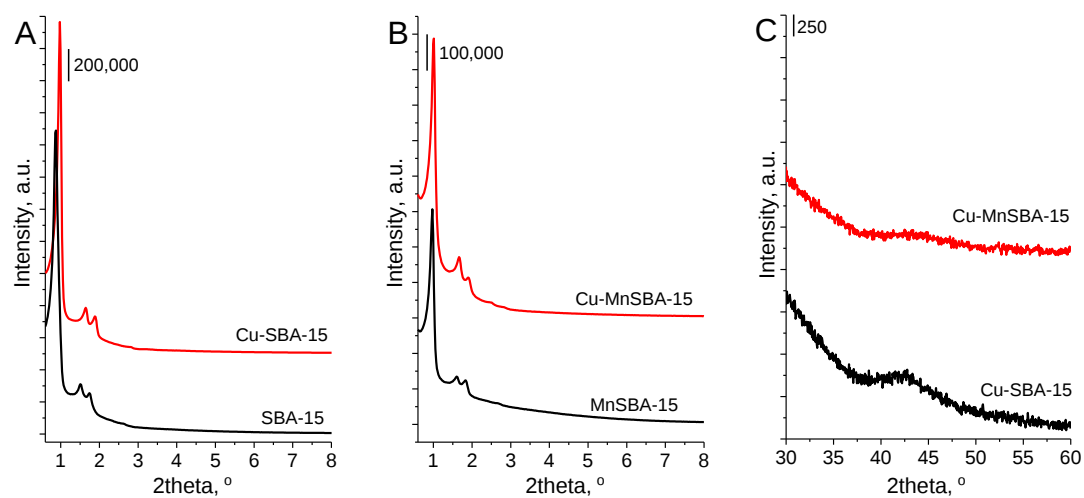


Figure S1. XRD patterns of SBA-15 and MnSBA-15 materials before and after modification with copper. (A, B) The range of 0.6° – 8° 2θ ; (C) The range of 30° – 60° 2θ .

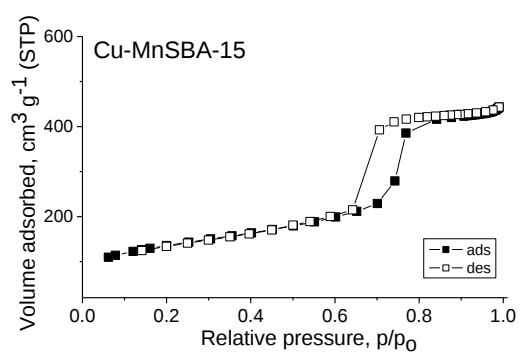
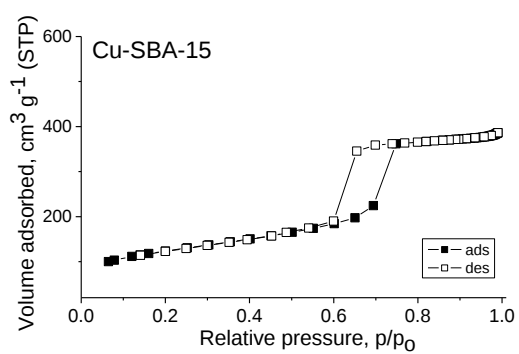
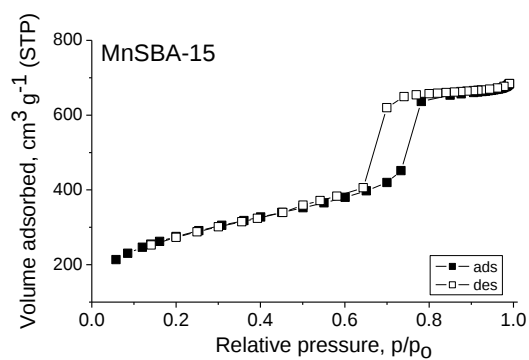
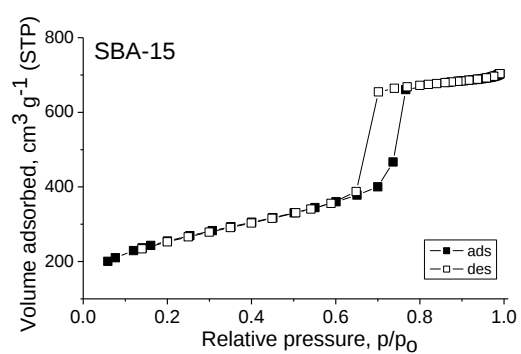


Figure S2. Nitrogen adsorption/desorption isotherms of SBA-15 and MnSBA-15 materials before and after modification with copper.

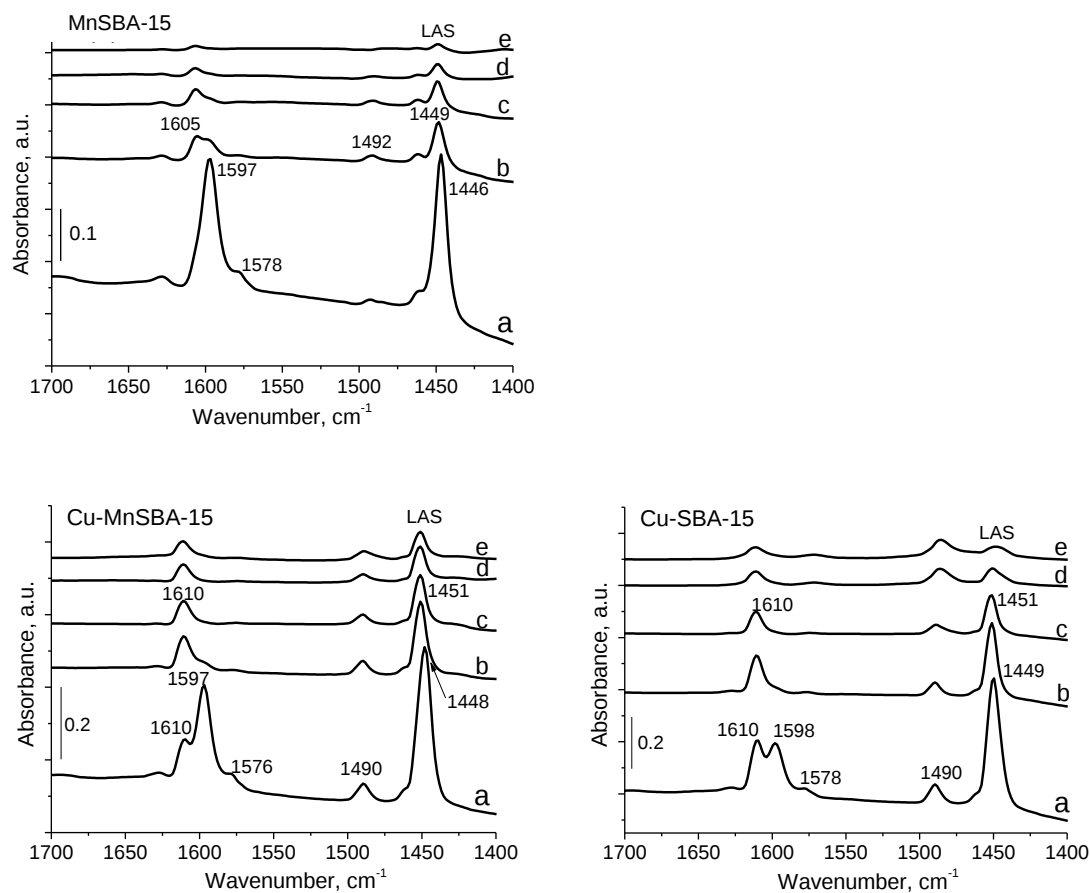


Figure S3. FTIR spectra after (a) adsorption of pyridine at 423 K on MnSBA-15, Cu-MnSBA-15 and Cu-SBA-15 materials and desorption at (b) 423 K, (c) 473 K, (d) 523 K, (e) 573 K for 30 min at each temperature.

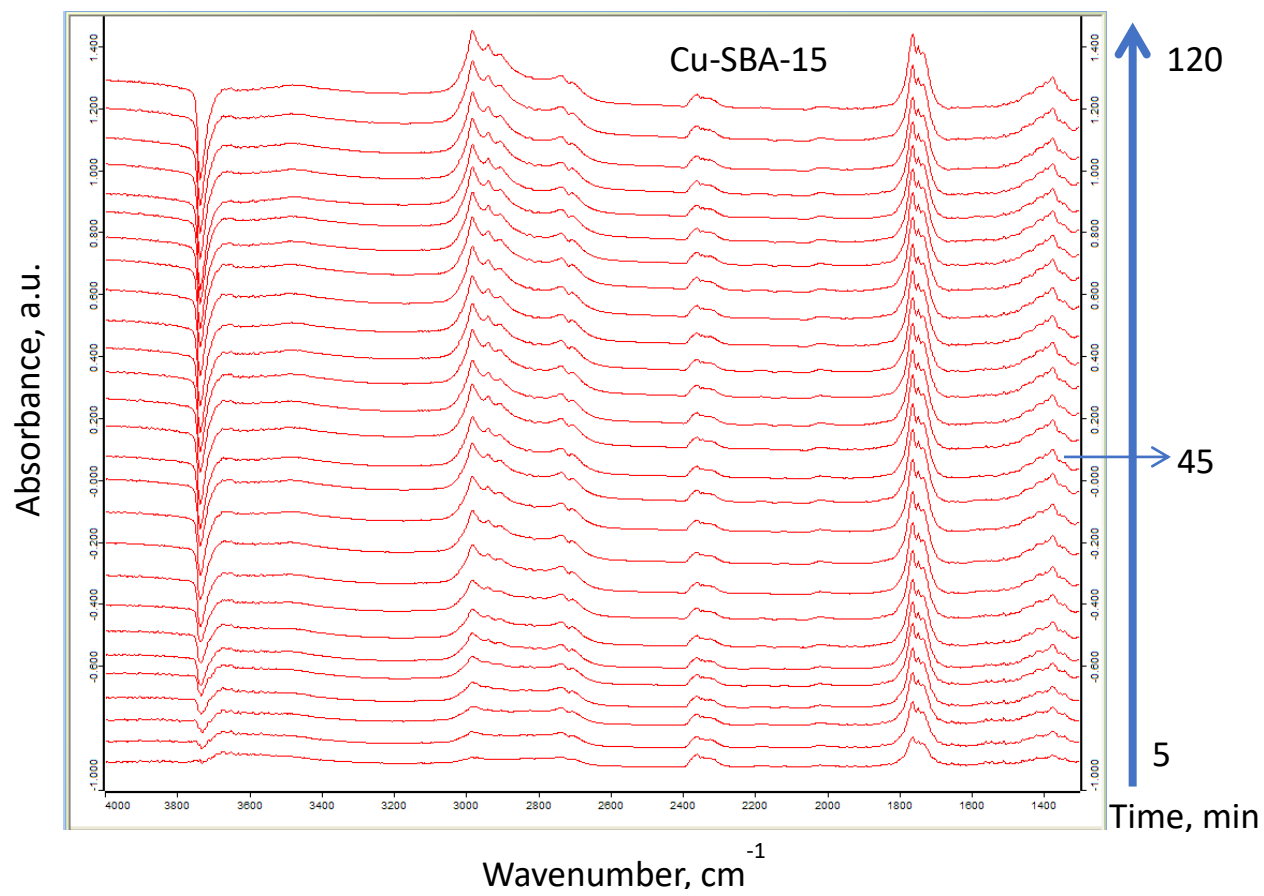


Figure S4. FTIR spectra recorded in ethanol flow at 593 K during 120 min for Cu-SBA-15 catalyst (4000-1300 cm^{-1} range).

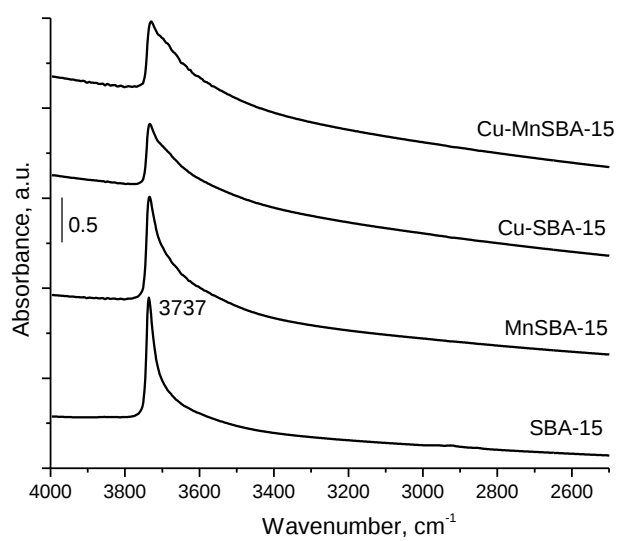


Figure S5. FTIR spectra of catalysts in the hydroxyl groups region ($4000\text{--}2500\text{ cm}^{-1}$) after activation in argon flow at 623 K.

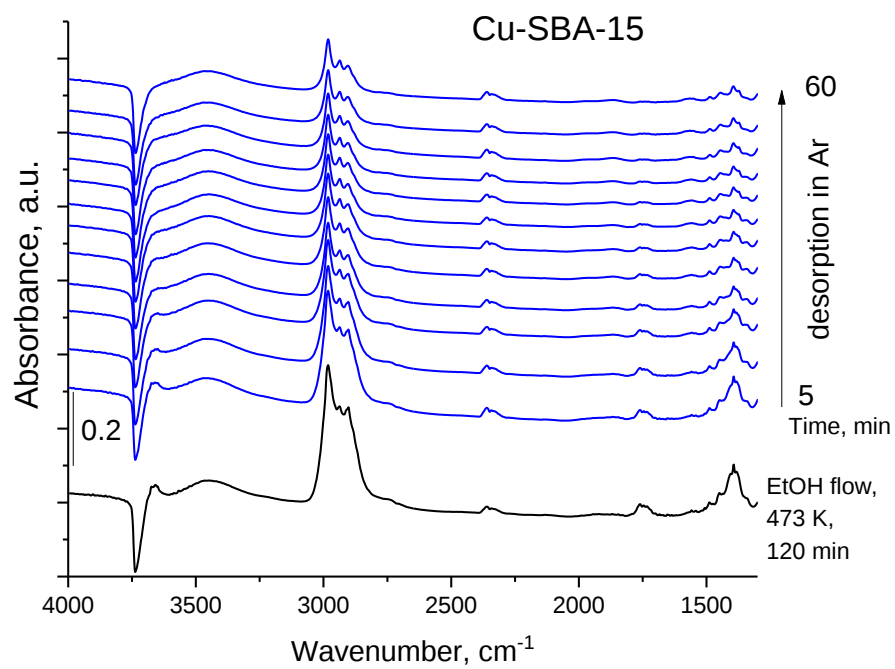


Figure S6. FTIR spectra recorded in argon flow at 473 K during 60 min for Cu-SBA-15 catalyst (4000-1300 cm^{-1} range).

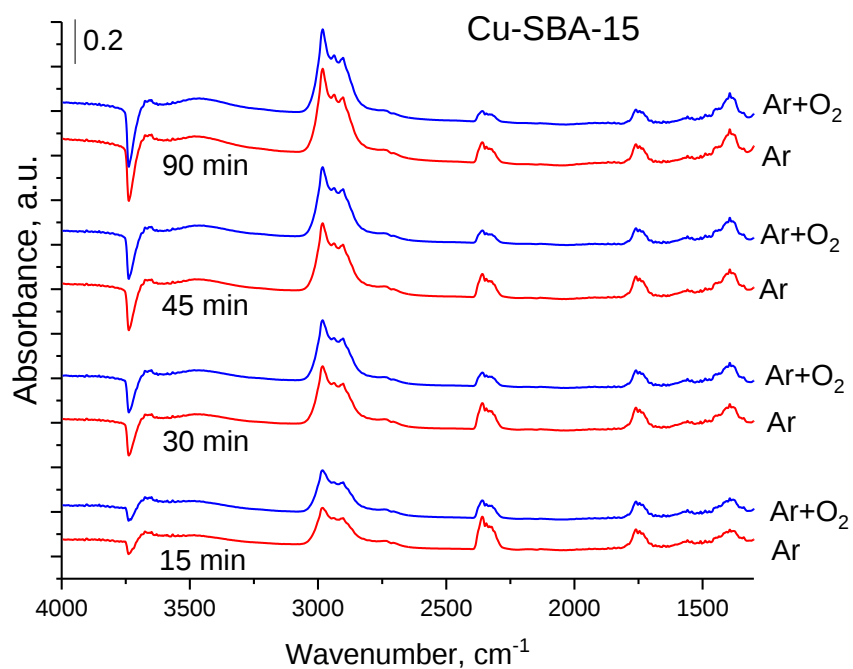


Figure S7. The comparison of FTIR spectra recorded in ethanol and oxygen flow at 473 K for Cu-SBA-15 after activation in Ar or Ar+O₂ flow after 15, 30, 45 and 90 min of the reaction (4000-1300 cm⁻¹ range).

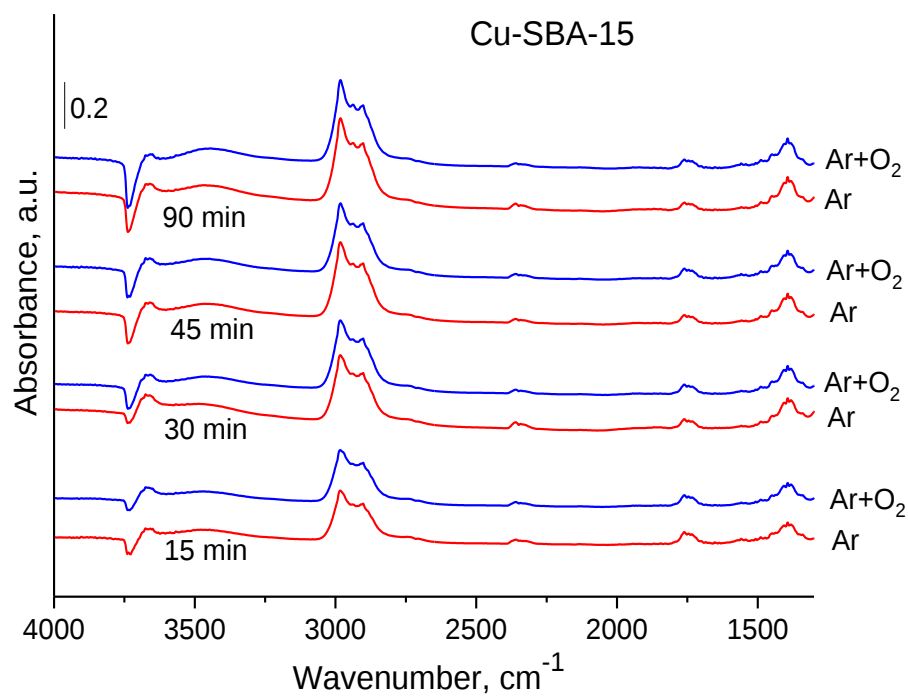


Figure S8. The comparison of FTIR spectra recorded in ethanol flow at 473 K for Cu-SBA-15 after activation in Ar or Ar+O₂ flow after 15, 30, 45 and 90 min (4000-1300 cm⁻¹ range).