

Enhancing Methane Conversion by Modification of Zn States in Co-Reaction of MTA

Contents

Figure S1. SEM images of HZSM-5, 1.0Zn/Z, 2.0Zn/Z, 3.0Zn/Z, 1.0Zn/Z-IE, 1.0Zn/Z-PM, 1.0Zn/Z-H₂ and 1.0Zn/Z-N₂.

Figure S2. EDS images of HZSM-5, 1.0Zn/Z, 3.0Zn/Z, 1.0Zn/Z-IE and 1.0Zn/Z-PM.

Figure S3. NH₃-TPD curves of HZSM-5, 1.0Zn/Z, 2.0Zn/Z and 3.0Zn/Z.

Figure S4. Product distribution of MTA and co-reactions on HZSM-5, 1.0Zn/Z, 2.0Zn/Z and 3.0Zn/Z.

Figure S5. XRD patterns in range of 5-50° of HZSM-5, 1.0Zn/Z, 2.0Zn/Z and 3.0Zn/Z and MFI simulated one.

Figure S6. NH₃-TPD curves of HZSM-5, 1.0Zn/Z, 1.0Zn/Z-IE and 1.0Zn/Z-PM.

Figure S7. Product distribution of MTA and co-reactions on HZSM-5, 1.0Zn/Z, 1.0Zn/Z-IE and 1.0Zn/Z-PM.

Figure S8. Aromatics selectivity of co-reaction over HZSM-5, 1.0Zn/Z, 1.0Zn/Z-IE and 1.0Zn/Z-PM by different Zn-loading strategies with time on stream.

Figure S9. XRD patterns in range of 5-50° of HZSM-5, 1.0Zn/Z, 1.0Zn/Z-H₂ and 1.0Zn/Z-N₂ and MFI simulated one.

Figure S10. Product distribution of MTA and co-reactions on HZSM-5, 1.0Zn/Z, 1.0Zn/Z-H₂ and 1.0Zn/Z-N₂.

Figure S11. Difference of product distribution between co-reaction and MTA reaction over HZSM-5, 1.0Zn/Z, 1.0Zn/Z-H₂ and 1.0Zn/Z-N₂.

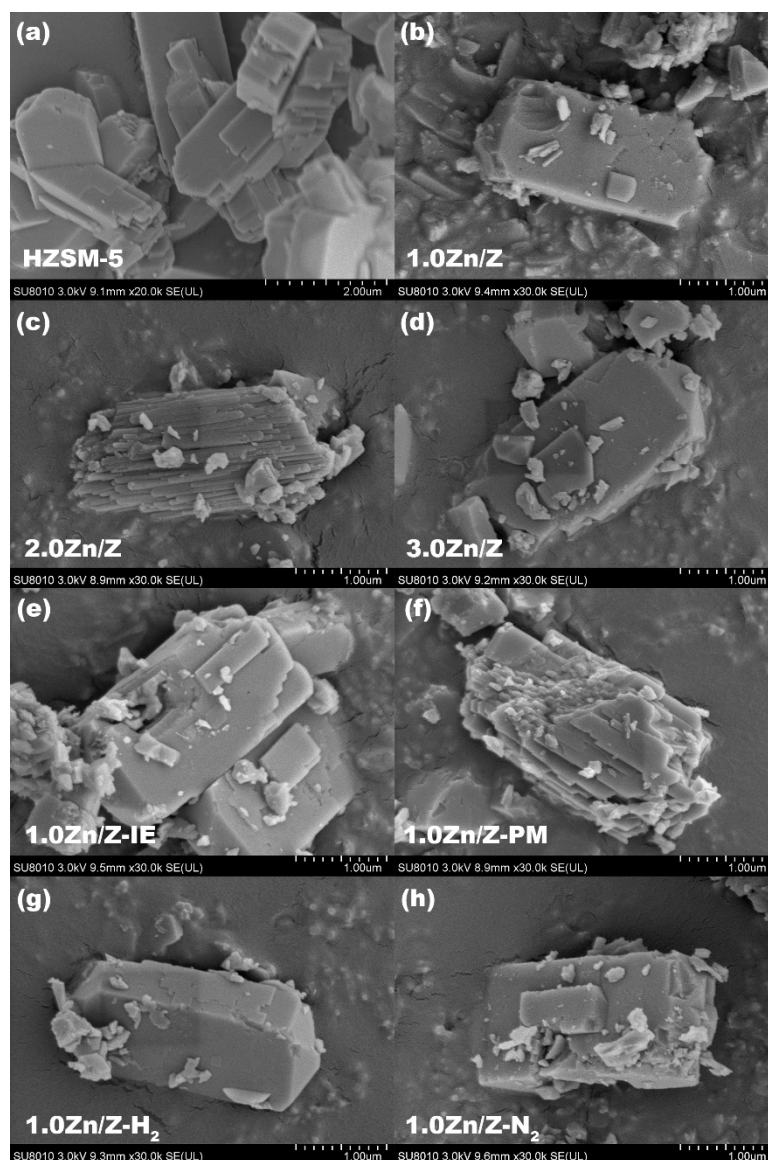


Figure S1. SEM images of HZSM-5, 1.0Zn/Z, 2.0Zn/Z, 3.0Zn/Z, 1.0Zn/Z-IE, 1.0Zn/Z-PM, 1.0Zn/Z-H₂ and 1.0Zn/Z-N₂.

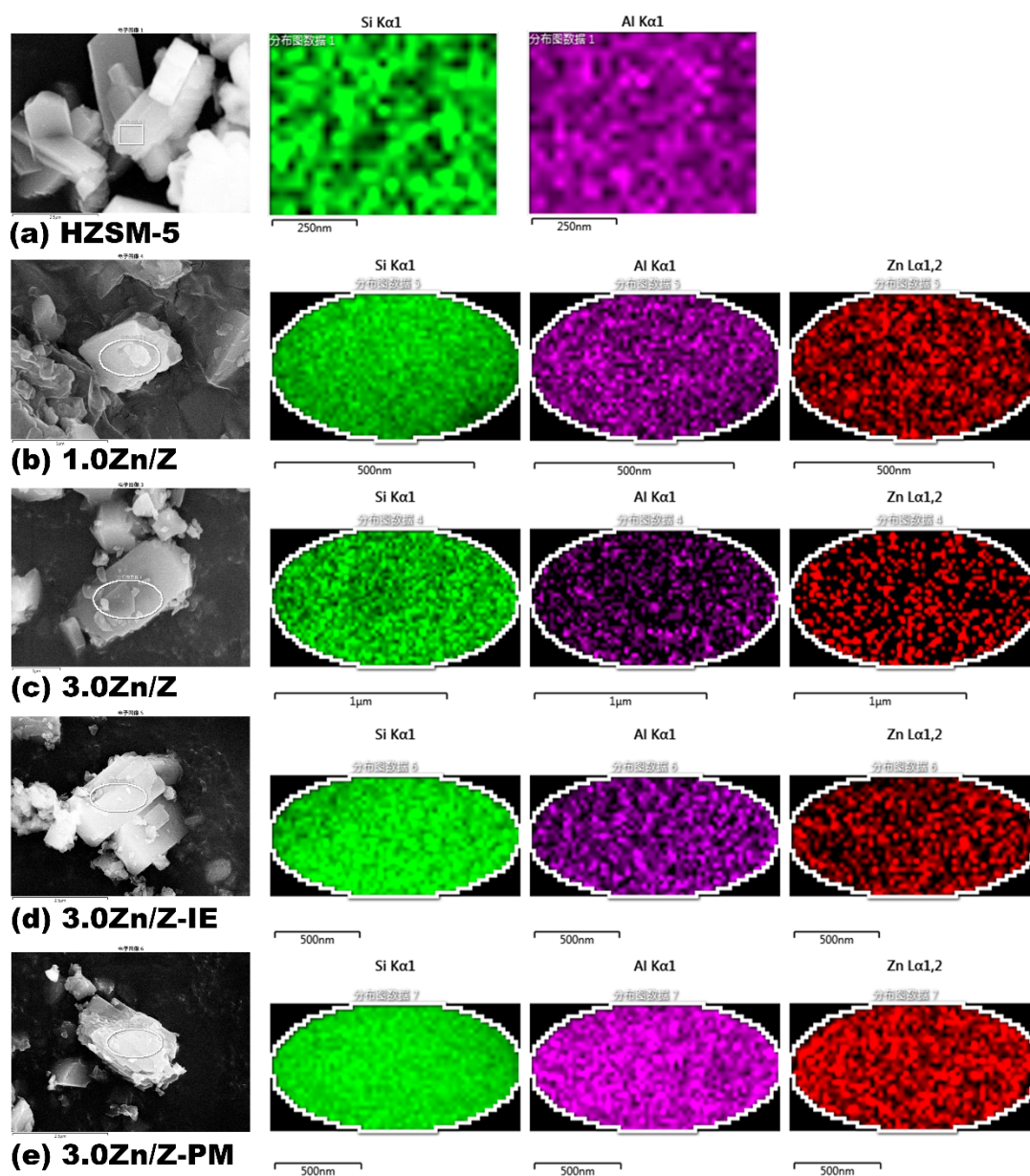


Figure S2. EDS images of HZSM-5, 1.0Zn/Z, 3.0Zn/Z, 1.0Zn/Z-IE and 1.0Zn/Z-PM.

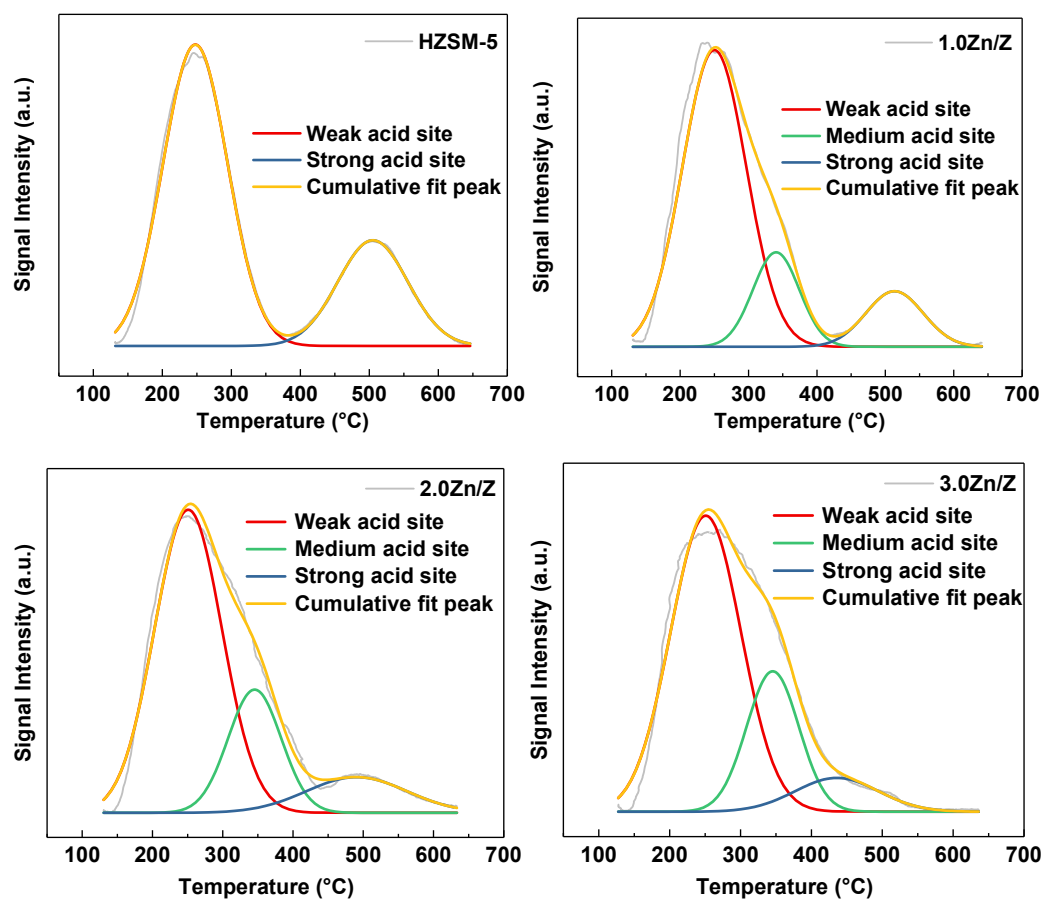


Figure S3. NH_3 -TPD curves of HZSM-5, 1.0Zn/Z, 2.0Zn/Z and 3.0Zn/Z.

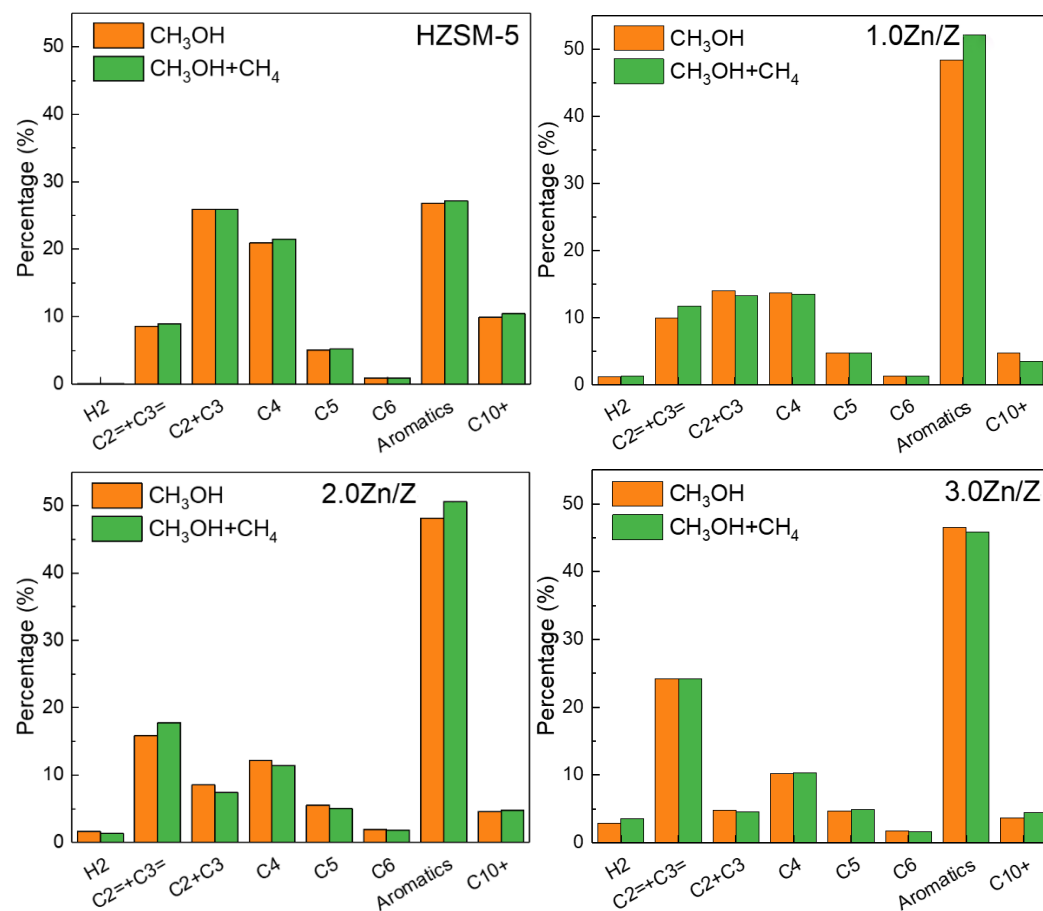


Figure S4. Product distribution of MTA and co-reactions on HZSM-5, 1.0Zn/Z, 2.0Zn/Z and 3.0Zn/Z.

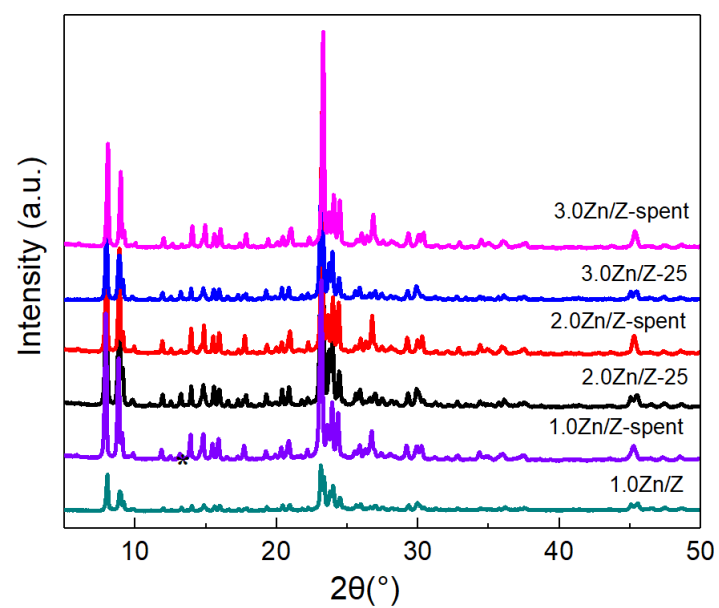


Figure S5. XRD patterns in range of 5-50° of HSZM-5, 1.0Zn/Z, 2.0Zn/Z and 3.0Zn/Z and MFI simulated one.

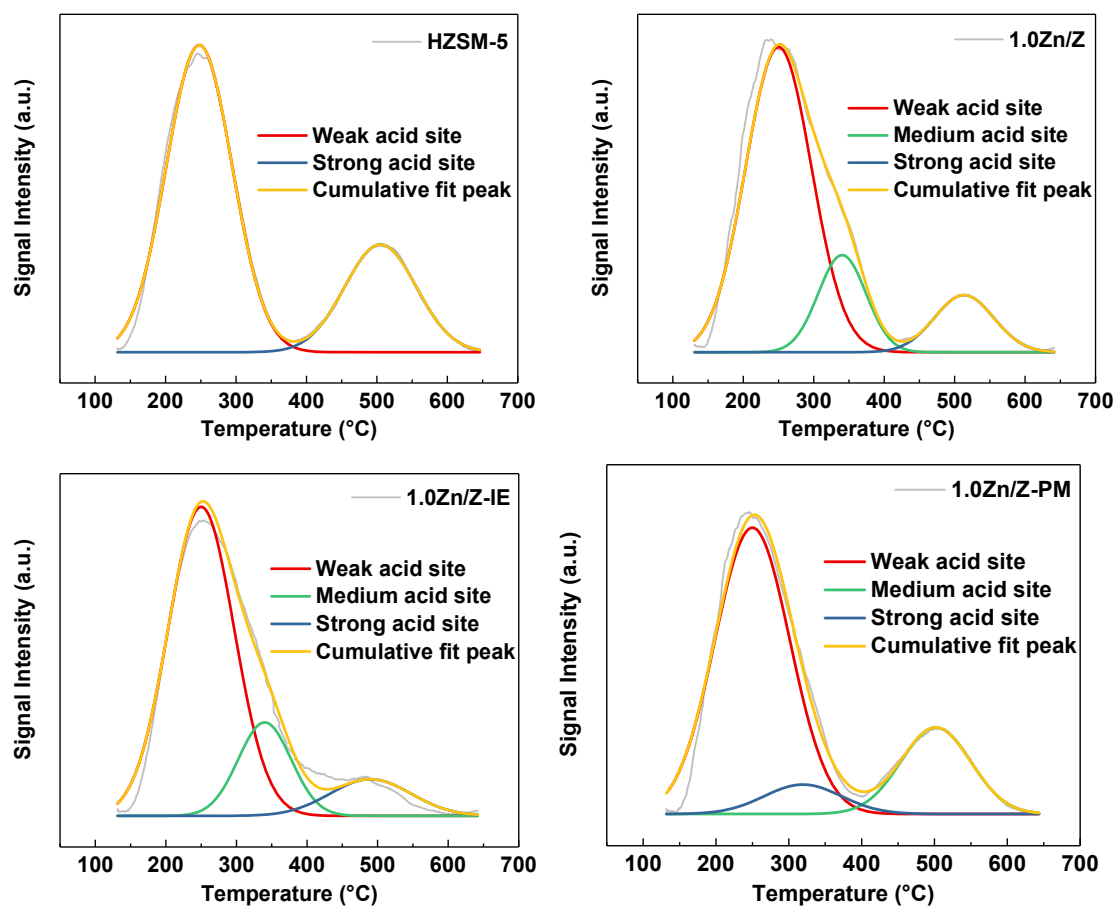


Figure S6. NH₃-TPD curves of HZSM-5, 1.0Zn/Z, 1.0Zn/Z-IE and 1.0Zn/Z-PM.

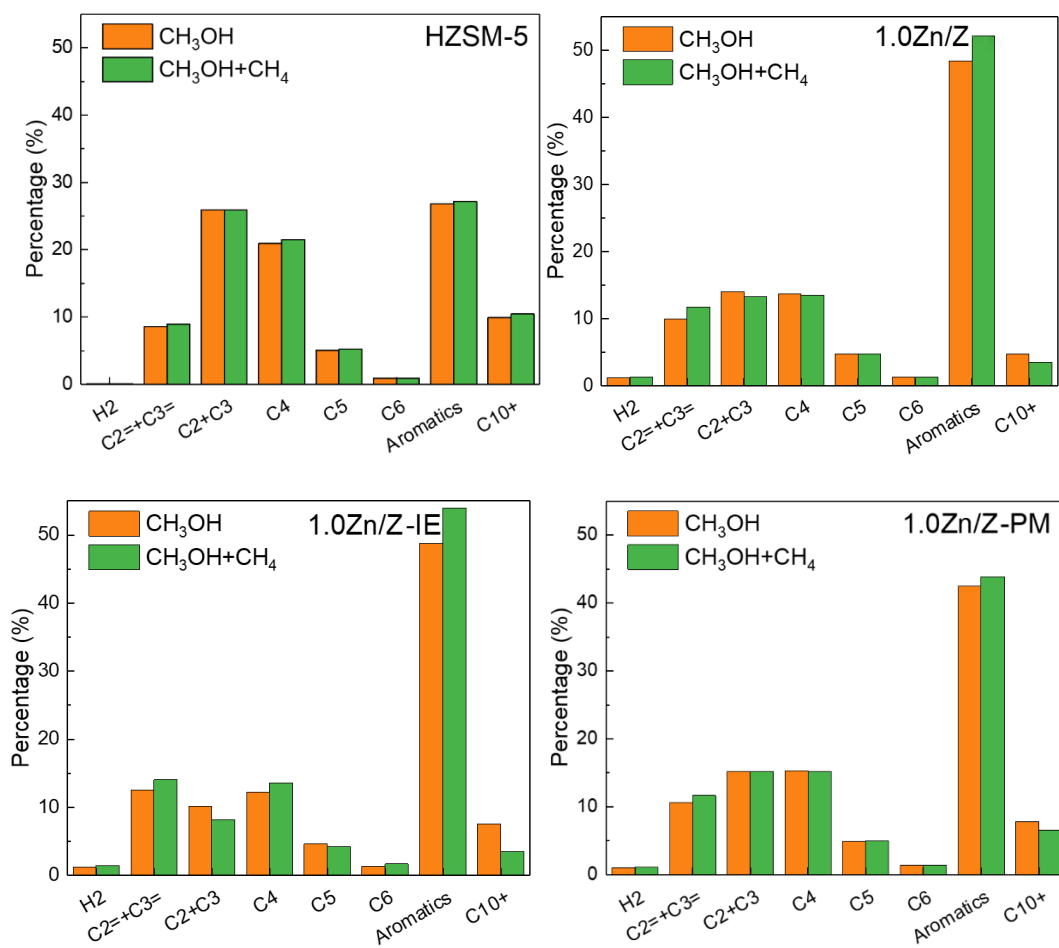


Figure S7. Product distribution of MTA and co-reactions on HZSM-5, 1.0Zn/Z, 1.0Zn/Z-IE and 1.0Zn/Z-PM.

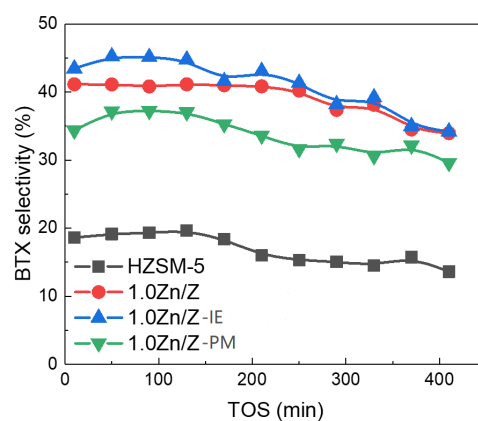


Figure S8. Aromatics selectivity of co-reaction over HZSM-5, 1.0Zn/Z, 1.0Zn/Z-IE and 1.0Zn/Z-PM by different Zn-loading strategies with time on stream.

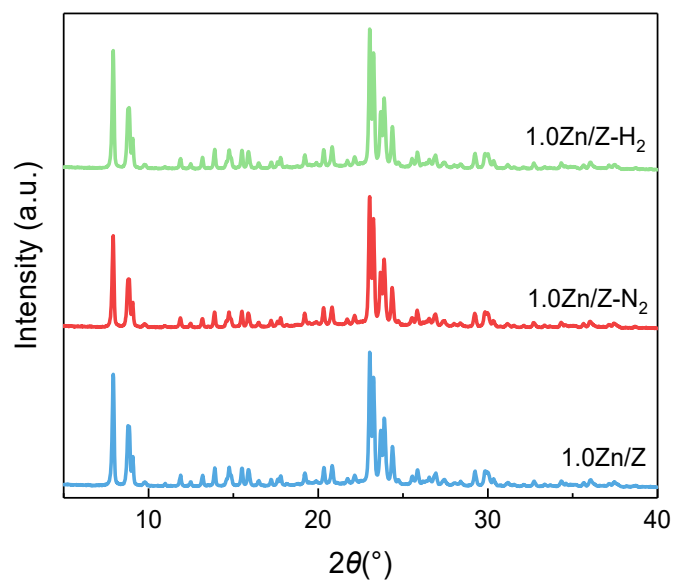


Figure S9. XRD patterns in range of 5-50° of HSZM-5, 1.0Zn/Z, 1.0Zn/Z-H₂ and 1.0Zn/Z-N₂ and MFI simulated one.

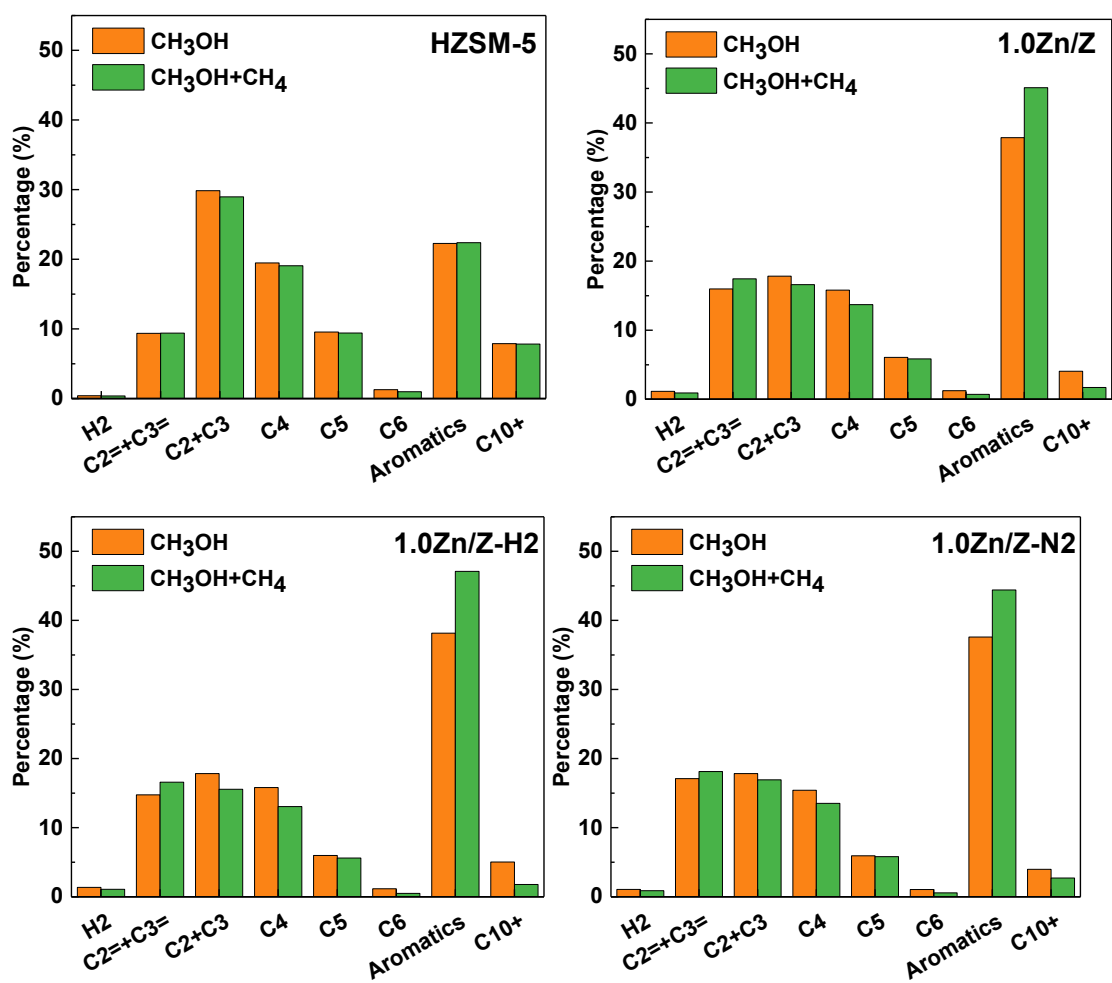


Figure S10. Product distribution of MTA and co-reactions on HZSM-5, 1.0Zn/Z, 1.0Zn/Z-H₂ and 1.0Zn/Z-N₂.

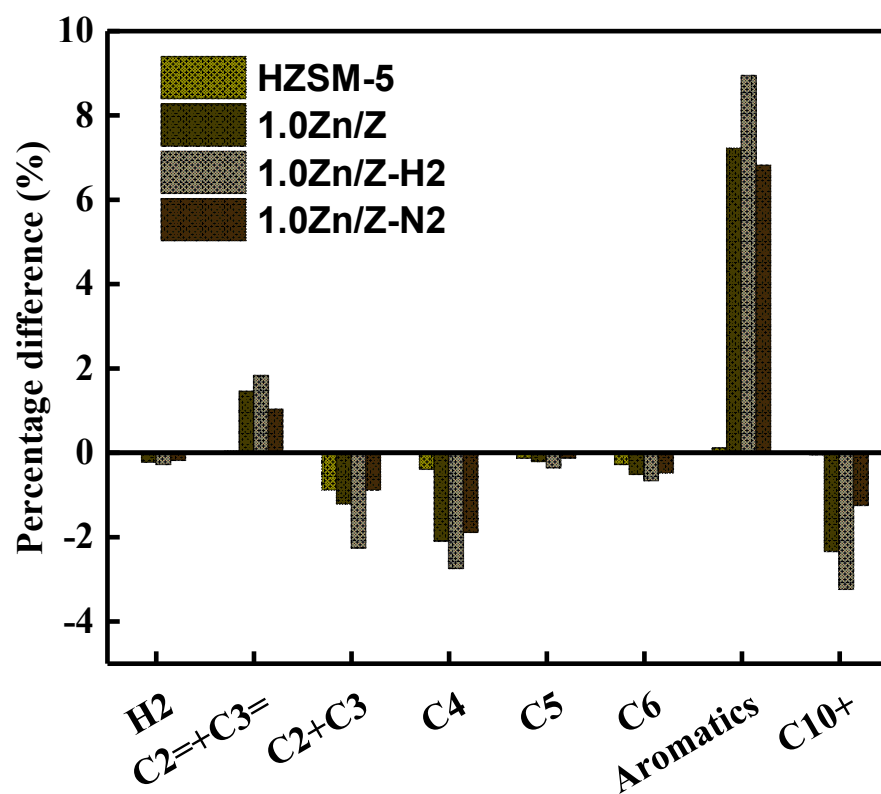


Figure S11. Difference of product distribution between co-reaction and MTA reaction over HZSM-5, 1.0Zn/Z, 1.0Zn/Z-H₂ and 1.0Zn/Z-N₂.