

Citric acid assisted Solid state Synthesis of CZA : Reduction free Catalyst for Methanol Synthesis from CO₂

Dr. Ramesh S., , , *

(djmoon@kist.re.kr*)

Copper Zinc Alumina (CZA) was prepared by a novel citric acid-assisted solid-state method and well characterized by various physico chemical techniques. During the decomposition of metal-citric acid precursors under nitrogen, H₂ was liberated and it act as in situ reducing agents to obtain pure metals and metallic catalysts. X-ray diffraction, X-ray photoelectron spectroscopy and temperature-programmed reduction analysis reveal that the as-prepared catalysts without further reduction are converted into metallic Cu, ZnO and Al₂O₃ species. TGA/DSC and XRD analysis results, illustrated that no amorphous carbon or carbonic residues are left after nitrogen calcination. The activity of the prepared catalysts without further reduction was investigated for methanol synthesis from CO₂ under fixed bed reaction conditions. The results were also compared with other reducing agents like Hydrazine (CZAH), formic acid (CZAF) and oxalic acid (CZAO).