

Linear α -olefin production from syngas over Na promoted Fe-Zn catalysts양선규^{1,2}, 이성우¹, 강석창¹, 한승주¹, 전기원¹, 이관영², 김용태^{1,†}¹한국화학연구원; ²고려대학교(ytkim@kriect.re.kr[†])

There is a gradual demand for linear alpha-olefins (α -olefins) because of its significant necessity as chemical intermediates for the production of polymers, fuels, lubricants, and plasticizer. Fischer-Tropsch synthesis (FTS) is one of the practical way to produce α -olefins from syngas ($H_2 + CO$). Iron carbides act as active sites for the selective hydrogenation of CO and maintaining its physicochemical properties under the FTS condition is important for hydrocarbon productivity. The addition of zinc (Zn) to iron oxides helps the active sites predominantly produce longer-chain hydrocarbons. The presence of sodium (Na) species on the surface of iron carbides boosts olefin production during the FTS. In this study, we hypothesize that the Na could interact with Fe-Zn mixed oxides differently to improve α -olefin production. We have tried to elucidate the reaction chemistry involving secondary reactions based on a detailed analysis of hydrocarbon products (i.e. paraffins, olefins, and oxygenates). We obtained a maximum α -olefin selectivity (34.7 %) in the range C2-C32 with the Na/Fe-Zn catalyst at 340 °C and 2.0 MPa.