Fischer-Tropsch synthesis on supported cobalt γ-Al_2O_3 catalysts in fixed bed and slurry bubble column reactors

우광재, 강석환, 박선주, 천주영, 전기원*
한국화학연구원
(kwjun@krict.re.kr*)

Fischer-Tropsch synthesis for the production of C_5+ hydrocarbons from syngas was carried out in a tubular fixed bed reactor (TFBR) and in a slurry bubble column reactor (SBCR). The Co-based catalysts for FTS were prepared by the conventional wet-impregnation of γ-Al_2O_3. Effects of operating conditions such as GHSV (1,000 - 4,000 ml/g·hr), reaction temperature (220 - 250 °C) and pressure (0.5 - 3.0 MPa) on the CO conversion and product selectivity of Co/γ-Al_2O_3 catalyst were examined in the TFBR and SBCR. The C_5+ selectivity and olefin selectivity in a SBCR were found to be higher than that in a TFBR, whereas C_2-C_4 selectivity showed a reverse trend. The CO conversion and product distribution in a SBCR were less sensitive than that in a TFBR with variations of reaction conditions.