

Oxidative coupling of methane by various silica-supported metal catalysts under DBD plasma condition

이희수, 김도희[†]

서울대학교 화학생물공학부

(dohkim@snu.ac.kr[†])

The direct utilization of methane which is main component of natural gas is limited to mostly fuel. In this circumstance, if methane is directly utilized as alternate feedstock to petroleum, it will be highly desirable for industrial catalysis reaction. Thus, many efforts have been done for methane conversion into more useful products like olefins. However, it is difficult goal for practical use for now because of the need for high temperature and relatively low hydrocarbon yield. In this experiment, oxidative coupling of methane has carried out to produce C₂ or C₃ hydrocarbons from methane. Also, since catalyst only reaction needed high temperature above 700°C, dielectric barrier discharge (DBD) plasma which is non-thermal plasma was applied to lower the reaction temperature. Among various supports, silica has shown the best performance. Therefore, diverse metals were loaded on silica to compare the effect under DBD plasma condition. As a result, C₂₊ hydrocarbon yield reached about 10% below the reaction temperature of 450°C.