

The effect of electrolyte wettability in methane steam reforming of DIR-MCFC

이윤지, 장성철, 박현서, 윤창원, 함형철, 윤성필<sup>†</sup>, 한종희,

조용수<sup>1</sup>

한국과학기술연구원; <sup>1</sup>연세대학교

Molten carbonate fuel cells (MCFCs) have attracted significant attention as an alternative power supply system due to high efficiency and environment sustainability. Moreover, the direct internal reforming (DIR) MCFC allows the use of various hydrocarbon fuels e.g. methane and ethanol. The stability and durability of catalyst is an important factor in DIR-MCFC systems. In general, the poisoning of DIR-MCFC catalyst occurs through loss of active site and surface area by electrolyte contact.

In this study, catalyst with low wettability to lithium sodium carbonate was developed to obtain high durability, and high activity in steam reforming of methane. To achieve low wettability, commercial catalyst (FCR-4, Süd-Chemie) were coated with Ru, Rh, and Cu by various methods. Wettability was measured by an optical contact angle measurement device in MCFC operation conditions, and performance of reforming catalyst was evaluated by gas chromatography. Results of Ru and Rh coated FCR-4 catalyst showed increase in methane conversion by 10% in accelerated poisoning tests. Further experiments are needed to evaluate long-term catalyst activity and stability.