

## Preparation and characterization of PtSn/C and PtSnAu/C catalysts for electro-oxidation of ethanol

김이영, 김수길, 한종희\*, 임태훈, 김한성<sup>1</sup>  
한국과학기술연구원; <sup>1</sup>연세대학교 대학원  
(jhan@kist.re.kr\*)

For the applications of portable power sources, direct liquid fuel cells such as DMFC and DEFC have been spotlighted as promising candidates that can replace the secondary battery system. Particularly, ethanol has been recently focused as fuel due to its high energy density, safety, and easy access. However, the electro-oxidation of ethanol follows complex routes that generates a series of by products such as acetaldehyde, acetic acid and CO<sub>2</sub>, resulting relatively low performance. In this study, binary and ternary Pt alloys of PtSn/C, and PtSnAu/C have been synthesized with the polyol method and have been used as anode catalysts. Various analysis tools were conducted to characterize the compositional and micro-structural properties of synthesized catalysts; ICP, XRD, and TEM. The electrochemical activities were also investigated with cyclic voltammetry. The results indicated that Pt<sub>3</sub>Sn<sub>2</sub>/C catalyst exhibited the high activity in the ethanol oxidation, while the addition of Au to form Pt<sub>5</sub>Sn<sub>2</sub>Au<sub>3</sub>/C enhanced the long term stability. Single cell tests using the corresponding catalysts will also be discussed.