

Particle size effect of PtRu/C catalyst on methanol oxidation

전민구, 전희중, 우성일*

한국과학기술원 생명화학공학과

& Center for Ultramicrochemical Process Systems

(siwoo@kaist.ac.kr*)

The particle size effect of a PtRu/C catalyst (E-tek) was studied by CO stripping and methanol oxidation experiments. The fresh catalyst was sintered at 300, 500, 600 and 700 °C for 3 h to increase the particle size of the fresh catalyst from 2.7 nm to 3.7, 4.7, 7.5 and 17.5 nm, respectively. From the CO oxidation, the electrochemically active surface area of the fresh catalyst decreased from 3.99 mC/cm² to 2.32, 2.06, 1.23 and 0.48 mC/cm² for the catalysts sintered at 300, 500, 600 and 700 °C, respectively. In the methanol oxidation, maximum activity was obtained for the catalyst sintered at 500 °C (4.7 nm). For catalysts smaller than 4.7 nm, activity decreased rapidly with decreasing particle size, while for catalysts larger than 4.7 nm, activity decreased slowly as particle size increased.