Development of new catalyst for enhancing oxygen reduction reaction in MCFC

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The technologies related with MCFCs have already escalated to a considerable level. However, so far, the researches related with MCFCs have been focused on obtaining long term stability in order to reach 40,000h-operation for commercialization. So, MCFCs show relatively low cell performance compared with solid oxide fuel cells (SOFCs). In order to enhance the cell performance of MCFC, new cathode has to be developed because the conventional cathode has still very high polarization compared with anode.

In this study, in order to enhance cathode performance for low temperature operation which improves cell span, Cu coated NiO cathode was prepared and its electrochemical performance was examined using single cell operation. Single cell using Cu coated cathode shows the much higher cell voltage of 0.87 V at initial time in cell operation than that of uncoated cathode, 0.79V at current density of 150 mAcm-2. To understand the reason of high cell performance after Cu coating, XPS analysis was carried out.