

卓越した大学院拠点形成支援補助金  
「流動ダイナミクス知の融合教育研究世界拠点」  
平成 25 年度 博士課程後期学生（国内）学会等派遣 参加報告書

氏名／専攻・学年 Name / Department	Riyan Achmad Budiman/ 東北大学流体科学研究所
学会名 Conference's name	第 22 回 Solid Oxide Fuel Cell 研究会
開催地 Venue (Name of the facility, city & country)	東京北の丸公園科学技術館
日程 Conference period	平成 25 年 12 月 19 日～12 月 20 日
発表タイトル Presentation Title	Mechanism for enhanced Electrochemical Performance on $\text{LaNi}_{0.6}\text{Fe}_{0.4}\text{O}_{3-\delta}$ - $\text{Ce}_{0.9}\text{Gd}_{0.1}\text{O}_{1.95}$ Composite electrode
<p>【発表概要 Brief summary of your presentation】</p> <p>Mixed conducting <math>\text{LaNi}_{0.6}\text{Fe}_{0.4}\text{O}_{3-\delta}</math> (LNF) electrode was combined with an ionically conducting oxide <math>\text{Ce}_{0.9}\text{Gd}_{0.1}\text{O}_{1.95}</math> (GDC) resulting high area specific conductivity (ASC). The enhancement of ASC did not only depend on their volume ratio but depended on sintering temperatures as well. Many studies show that electrochemical performance enhances on MIEC composite. However, the mechanism of enhancement has not been fully understood so far. If the electrochemical performance of LNF is enhanced by mixing with GDC, it might be not only due to the extension of triple phase boundary because LNF itself has sufficient ionic conductivity to reduce the oxygen at some portion of the electrode surface. The reason of enhancement MIEC composite has the possibility of enhancement of catalytic activity. The catalytic activity itself could also be enhanced at the junction of the two oxides. In order to clarify the enhancement of catalytic activity by presence of GDC, the <math>\text{LaNi}_{0.6}\text{Fe}_{0.4}\text{O}_{3-\delta}</math> film electrode was coated with <math>\text{Ce}_{0.9}\text{Gd}_{0.1}\text{O}_{1.95}</math> porous layer on the top and then compared to the bare <math>\text{LaNi}_{0.6}\text{Fe}_{0.4}\text{O}_{3-\delta}</math> film electrode.</p>	

【他の講演等から得られた知見、感想等。What you learned from other presentations, general impression you had, etc.】

For around 2 days, it was good chance to meet another researcher and had many discussions. The topic of this conference is quite large start from material processing to system of solid oxide fuel cell. I learned several things on this conference, such as study on the hetero-structured electrode for solid oxide fuel cell. The hetero-structured electrode with has two different phase (different crystal structure) has such a good electrode performance. Many researchers try to understand the reason of its enhancement. One of the interesting reasons of enhancement presented during this conference. Although, that study needs to be clarified, however I wish I can doing some research on it also.

This conference is actually bridge to meet between scholar and industrial. Some people from industry come to this conference to see what kind of collaboration that they can make. It is really interesting, since we can make some collaboration with the industry to develop new material or to develop the system we have to enhance SOFC research.