中国科学院
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学术报告(6.21,周二)

题目：Oxygen Reduction Reaction in Infiltrated Solid Oxide Fuel Cell

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Abstract

Solid oxide fuel cells (SOFCs) are promising candidates for future energy conversion systems because of their high energy conversion efficiency than those for conventional heat engine systems and other types of fuel cells. However, there are several major technical hurdles to overcome before SOFC's wide applications, namely (1) impurity effects on anode, (2) developing interconnect coatings to mitigate Cr-poisoning related issues, and (3) developing highly efficient and stable cathode. Infiltration methods have been widely employed to improve the oxygen reduction reaction (ORR) kinetics of SOFC cathode. The principal assumption in infiltration is that infiltrants having high oxygen absorption capabilities enhance oxygen flux into the cathode and thus improve the cathode performance. However, few systematic investigations exist on ORR mechanisms in infiltrated SOFC cathodes. In this talk, we report our studies on several issues fundamental related to infiltrated cathode: (1) ORR mechanisms and kinetics in baseline and infiltrated cathode; (2) accurate determination of important kinetic parameters; and (3) development of SOFC cathode infiltrants selection criterion; and. The preliminary results show that over-potential, as well as other materials' intrinsic characters, have important effect on ORR behavior in infiltrated cathode.

About Prof. Xingbo Liu

Dr. Xingbo Liu received his Ph.D. on Materials Science from University of Science and Technology Beijing in 1999, and he subsequently went to West Virginia University as a postdoc. Currently, he is the professor & associate chair for research in Mechanical & Aerospace Engineering Department at West Virginia University. Dr. Liu has developed a national recognized research program on materials for next generation energy conversion and storage, with the focus on solid oxide fuel cells and batteries. Dr. Liu has been serving leading roles in TMS, ACerS, and ECS, and he has received numerous awards, including one R&D 100 Award (2011) for his development of SOFC interconnect coating, TMS Early Career Faculty Fellow Award (2010), West Virginia Innovator of the Year (2013), WVU CEMR Researcher of the Year (2015, 2011), Outstanding Researcher Awards (2015, 2011, 2009, 2008), and several others. Most recently, Dr. Liu was elected as the Fellow of ASM International (2015), and received TMS Brimacomb Medal (2016).

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