

2025

6.25 (wed.) 12:10
12:50

12:10-12:15

◆ Introduction

12:15-12:40

◆ Seminar
(Presentation)

12:40-12:50

◆ Q&A

Online
(Zoom)Scan here for
Registration ▶▶https://us02web.zoom.us/webinar/register/WN_XLiSMj_gT5qWe7zSuAfOAAQ

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Contributing to the achievement of carbon neutrality through ammonia application as a fuel



Key Words

Carbon neutrality

Carbon-free fuel

Ammonia combustion

Nitrogen oxides

Burners

Emissions control

Gas turbine

Chemical kinetics

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Dr. Okafor is an associate professor at the Department of Mechanical Engineering of Kyushu University. He obtained a bachelor degree in engineering from his home country, Nigeria and came to Japan in April 2010 for graduate studies at Kyushu University under the MEXT scholarship program. He obtained a PhD in engineering in September 2015 and immediately joined Tohoku University as a postdoctoral researcher. Thereafter, he joined the National Institute of Advanced Industrial Science and Technology, AIST in April 2019. Dr. Okafor returned to Kyushu University in January 2022 as an associate professor while concurrently working with AIST as a visiting researcher. His research interest includes the combustion of carbon-free fuels such as hydrogen and ammonia. He has won several awards based on his studies on ammonia combustion including the Young Investigator Award from the Asia Pacific Section of the Combustion Institute in 2021, and other awards from the Combustion Society of Japan such as the Best Paper Awards in 2019, 2020 and 2023 and Research Incentive Award in 2021. Aside from research and education, he is interested in the welfare of international students and have worked as the head of Culture Section of the Kyushu University Foreign Students Association (KUFSA) from 2011 to 2013, the student chairman of the Students Committee for Internationalization of Kyushu University (SCiKyU) from 2013 to 2014 and the patron of the African Society of Kyushu University (ASKU) from 2022 till date.

In order to achieve carbon neutrality by 2050, it is important to develop combustion technologies for carbon-free fuels, which do not emit CO₂ when burned. One of the candidates for this fuel is ammonia. Currently, ammonia is mostly used as a raw material for fertilizers and chemical products. It can also be used as a fuel in combustion devices. However, ammonia burns very slowly, which makes its application as a fuel in combustion devices challenging. In addition, the combustion of ammonia may produce large amounts of oxides of nitrogen (NO_x), which are detrimental to human health and the environment.

I will introduce how my research is contribution to the development of combustion technologies for ammonia towards the achievement of a carbon-neutral society.