

Abstract Submitted
for the GEC17 Meeting of
The American Physical Society

Development of ice dielectric barrier discharge for the development of novel reaction field in cryogenic environments NORITAKA SAKAKIBARA, TSUYOHITO ITO, KAZUO TERASHIMA, University of Tokyo — Multi-phase plasmas, including plasma-liquid interactions, are now receiving increasing attention aiming for the wide range of applications. As a new type of multi-phase plasma, ice dielectric barrier discharge (DBD), whose dielectric barrier is made of ice, was generated at a wide range of cryogenic temperature from room temperature down to 6.5 K. We are expecting plasma-ice interaction system as a novel cryogenic reaction field, taking advantage of selective chemical reactions on the ice surface. In this research, gas temperature was treated as a control parameter, and variations of optical emission spectra and discharge modes were observed. In particular, we revealed drastic change in power consumption of ice DBD in the vicinity of the melting point of water (273 K). This clearly indicates the importance of gas temperature as a control parameter in the research area of multi-phase plasmas. Moreover, in the presentation, we will present results of material synthesis with using the ice DBD, which is in progress.

Noritaka Sakakibara
University of Tokyo

Date submitted: 02 Jun 2017

Electronic form version 1.4