

気液界面プラズマによる炭素材料スルホン化機構の調査

Investigation of Carbon Sulfonation Mechanism by Plasmas in Contact with Liquid

東工大¹, 岩手大², 大分大³, 名古屋大⁴, 釜山大⁵ °(D) DENG Siqi¹, YAO Kaixun¹, 児玉 学¹,

高橋 克幸², 立花 孝介³, 稗田 純子⁴, LI Oi Lun⁵, 竹内 希¹

Tokyo Tech¹, Iwate Univ.², Oita Univ.³, Nagoya Univ.⁴, Pusan National Univ.⁵,

°Siqi Deng¹, Kaixun Yao¹, Manabu Kodama¹, Katsuyuki Takahashi², Kosuke Tachibana³,

Junko Hieda⁴, Oi Lun Li⁵, Nozomi Takeuchi¹

E-mail: deng@hv.ee.e.titech.ac.jp

Plasma technology, a green technique that could oxidize organic pollutants and make materials hydrophilic, is a promising technique in several applications. In our previous study, we used plasma-liquid interactions to sulfonate carbon materials. Sulfonated carbon material as a promising catalyst in the biomass transformation process, needs strict conditions to produce over the past decade. By plasma discharge, the sulfonated carbon could be produced by dilute sulfuric acid. In this study, two kinds of carbon materials are used, and it shows different sulfonation results in each kind of material. In the case of GNPs (graphene nanoplatelets), it is difficult to add sulfonic groups on the carbon surface. On the contrary, in the case of CNTs (carbon nanotubes), the plasma technique could easily sulfonate it. The catalytic performance of these two kinds of treated carbon materials is investigated.

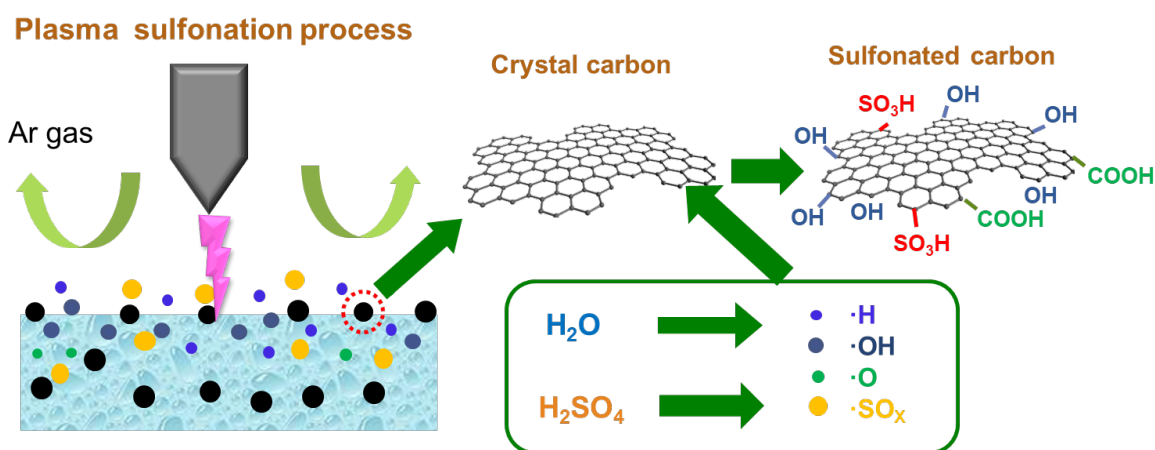


Figure 1: schematic of plasma sulfonation procedure.