Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Organic Decomposition Performance of In-line Liquid Treatment System Using Microwave Plasma MICHIKO ITO, Nagoya University, Plasma Center for Industrial Applications, SEIGO TAKASHIMA, Plasma Center for Industrial Applications, NORIO NOMURA, TOMINORI NOMURA, Sanshin Mfg. Co., Ltd, HIROTAKA TOYODA, Nagoya University, Plasma Nanotechnology Research Center — Plasmas production in the vicinity of gas-liquid interface is expected as a new liquid treatment technique due to its high production rate of chemically reactive species (OH, O, etc.) and fast transfer of reactive species in liquid phase. So far, we have proposed a microwave plasma device using Venturi effect to treat a liquid, and have reported drastically-enhanced processing performance of organic decomposition by this plasma source. In this study, decomposition performance of various organic compounds such as phenol, methylene blue or diethylenetriamine is investigated. In the experiment, plasma is produced inside a gap between top and bottom parts of the nozzle by a pulsed 2.45 GHz microwave (peak power: <1.2 W, pulse repetition frequency: 10 kHz). During the plasma treatment, solutions are continuously supplied to the nozzle at a flow speed of 10.5 $\sim$ 22.0 m/s. After the treatment, residual concentration is evaluated by high performance liquid chromatography, gas chromatography and so on. The result indicates the decomposition efficiency becomes different depending on organic matters. Origin of the efficiency difference will be discussed.

Michiko Ito
Nagoya University, Plasma Center for Industrial Applications

Date submitted: 19 Jun 2015 Electronic form version 1.4