

Abstract Submitted  
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**Chemical reaction by plasma in gas-liquid two-phase flow system**  
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HIDEAKI KANDA, Nagoya University — Two plasma processes using gasliquid  
two-phase flow were developed. One is gas/liquid slug flow in capillary glass tube  
where gas bubbles moved stably in liquid flow. Plasma was generated in bubbles by  
pulsed bipolar voltage and the liquid phase was mixed by circulated convection due  
to shearing force. As a gas, air, argon, helium, oxygen, or nitrogen was used. The  
pulsed bipolar voltage of 10 kV was applied at 10 kHz. The generated plasma was  
evaluated by ICCD image and high speed camera. The optical emission spectra was  
analyzed to identify the active species. By using this process, organic compound  
dissolved in liquid aqueous phase was reacted with oxidation. Another process was  
creeping plasma on flowing liquid film along glass tube outer surface. Owing to  
the thin film thickness, organic compound dissolved in liquid phase was reacted  
effectively. Therefore, effective reaction process could be established in gas/liquid  
two-phase flow by controlling the gas/liquid flow.

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