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Evolution of Spatial pH Distribution in Aqueous Solution induced by Atmospheric Pressure Plasma SHIGENORI TAKAHASHI, KAKERU MANO, YUI HAYASHI, Department of Chemical Engineering, Nagoya University, NORIHARU TAKADA, Nagoya University, HIDEKI KANDA, MOTONOBU GOTO, Department of Chemical Engineering, Nagoya University — Discharge plasma at gas-liquid interface produces some active species, and then they affect chemical reactions in aqueous solution, where pH of aqueous solution is changed due to redox species. The pH change of aqueous solution is an important factor for chemical reactions. However, spatial pH distribution in a reactor during the discharge has not been clarified yet. Thus, this work focused on spatial pH distribution of aqueous solution when pulsed discharge plasma was generated from a copper electrode in gas phase to aqueous solution in a reactor. Experiments were conducted using positive unipolar pulsed power. The unipolar pulsed voltage at +8.0 kV was applied to the copper electrode and the bottom of the reactor was grounded. The size of the reactor was 80 mm wide, 10 mm deep, and 40 mm high. The electrode was set at distance of 2 mm from the solution surface. Anthocyanins were contained in the aqueous solution as a pH indicator. The change pH solution spread horizontally, and low pH region of 10 mm in depth was formed. After discharge for 10 minutes, the low pH region was diffused toward the bottom of the reactor. After discharge for 60 minutes, the pH of the whole solution decreased.

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