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Using advanced oxidation treatment for biofilm inactivation by varying water vapor content in air plasma[1] SUGANUMA RYOTA, YASUOKA KOICHI, Tokyo Tech — Biofilms are caused by environmental degradation in food factories and medical facilities. The inactivation of biofilms involves making them react with chemicals including chlorine, hydrogen peroxide, and ozone, although inactivation using chemicals has a potential problem because of the hazardous properties of the residual substance and hydrogen peroxide, which have slow reaction velocity. We successfully performed an advanced oxidation process (AOP) using air plasma. Hydrogen peroxide and ozone, which were used for the formation of OH radicals in our experiment, were generated by varying the amount of water vapor supplied to the plasma. By varying the content of the water included in the air, the main product was changed from air plasma. When we increased the water content in the air, hydrogen peroxide was produced, while ozone peroxide was produced when we decreased the water content in the air. By varying the amount of water vapor, we realized a 99.9% reduction in the amount of bacteria in the biofilm when we discharged humidified air only.

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