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Plasma Acid Formation from the Interaction of a Gliding Arc Plasmatron and Water RYAN ROBINSON, A.J. Drexel Plasma Institute, Mechanical Engineering & Mechanics, Drexel University, ALEXANDER GUTSOL, Chevron Energy Technology, ALEXANDER RABINOVICH, ALEXANDER FRID-MAN, A.J. Drexel Plasma Institute, Mechanical Engineering & Mechanics, Drexel University — Recently there has been an increased interest in hydrogen production and the bio-medical applications from plasma treated water. Research shows that the interaction of non-thermal plasma discharges and water produces an acidic solution. Hydrogen peroxides and nitrates are commonly produced from the interaction depending on the gaseous environment of the plasma. This study investigates the production of a "plasma acid" from a water spray through a thermal discharge, provided by a DC gliding arc plasmatron (GAP). This method allows for a continuous processing of water rather than the batch processing of other methods that rely on surface interaction with plasma on a volume of water. Air, oxygen, and nitrogen were used as the carrier gas of the water spray and the tangentially fed gas in the discharge region. The production of nitric acid and peroxide was specifically monitored using methods from pH metering, spectrophotometry, and specialized test strips. From air and nitrogen environments there was a small production of peroxide, and larger concentrations of nitric acid. Oxygen environments produced much larger concentration of peroxide, while marginal amounts of nitric acid. In all of the environments, the absorption spectrums showed the presence of other compounds.

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