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A Characterization of Portable HF Air Plasma Jet

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A new portable low temperature plasma jet system is developed using ambient air as plasma gas. This atmospheric pressure plasma source is rich sources of reactive oxygen and nitrogen species (RONS) which play crucial roles in biomedical applications. Especially, Nitric oxide radical (NO), hydroxyl radical (OH) and ozone (O_3) in this plasma source have been suggested to be powerful agents in wound healing, cancer therapy, sterilization, and dentistry. By varying the air flows, the plasma source can be optimized for nitric oxide, ozone and hydroxyl radical production. Optical emission spectroscopy (OES) was used to determined OH radical in the effluent of the plasma source for varied air flows. The concentration of NO and O_3 has been investigated and measured by absorption spectroscopy and electrochemical detector at variable gas flows. Correlations between plasma parameters and concentrations as well as temperature of the effluent of the plasma source will be reported and discussed in this report.

Keyword: portable plasma jet, atmospheric pressure plasma, reactive oxygen and nitrogen species, biomedical applications.

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