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The Investigation of Surface Modification Techniques for Ozone Generators William P. Davis, Daniel E. Guerrero and Jose L. Lopez
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Ozone is produced on an industrial scale normally through a dielectric barrier discharge (DBD) plasma reactor, where a high energy electric field propagates between to electrodes separated by a dielectric, with a mixture of pure Oxygen gas (O_2) and Nitrogen admixture (N_2) flowing through the gap between the electrodes. Nitrogen itself plays an important role in the concentration of ozone produced from these plasma reactors. While it is known that N_2 is used as a third body collider, another important yet poorly understood function comes from the nitrogen being added to the feed gas into the reactor. Previous studies indicate that when the N_2 feed gas is shut off, the ozone concentrations in the gas effluent proceeds to drop gradually over time, indicating that the nitrogen itself is having an effect on the ozone production. This experiment aims to investigate, why nitrogen effects the production of ozone, and to investigate if there is any way to produce this effect on different metals including stainless steel, using a nitrogen plasma treatment, to see if they are similar or better results when used as electrodes in a DBD plasma reactor. It will also characterize each electrode based on different parameters including but not limited to Ozone production, SEM and FTIR.

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