INVESTIGATION OF TRIPLET ATMOSPHERIC COLD PLASM JET FOR DECONTAMINATION APPLICATIONS

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In this paper, investigation of triplet atmospheric plasma jet using argon and oxygen gases is reported. Longitudinal geometrical configuration for the electrodes is chosen in which increases the jet length. Electrical characteristics, chemical reactive species such as ozone, atomic oxygen, NOx compounds and hydroxyl concentrations are measured. In table 1 applied voltage, frequency of the power supply, ozone concentration and the maximum length of the jets are listed. It was found that the breakdown voltage of triplet and single plasma jet was 2.76 KV and 2.48 KV, respectively. It is seen that the ozone concentration increases about one order of magnitude with triplet plasma jet. Such increments hold for atomic oxygen concentration, too. Optical emission spectroscopy is used to identify and measure the plasma species at the effluent of the nozzle. The device could be used for surface decontamination to disinfect bacteria and hazardous chemical compounds. In figure 1 a schematic view of the device is seen.

Table 1: Some specification of the triplet atmospheric plasma jet

<table>
<thead>
<tr>
<th>Type of jet</th>
<th>Flow (Lit/m)</th>
<th>Vpp (kv)</th>
<th>Ozone concentration (ppm)</th>
<th>Max length (Cm)</th>
<th>Freq (kHz)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triplet jet</td>
<td>5</td>
<td>5.44</td>
<td>4.5</td>
<td>3</td>
<td>18.78</td>
</tr>
</tbody>
</table>

Figure 1: Schematic view of the triplet plasma jet

References: