EXPERIMENTAL STUDY OF SINGLE BARRIER DBD FOR THE APPLICATION OF WATER TREATMENT

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Dielectric Barrier Discharge (DBD) technology has received much attention in recent years[1] and found highly useful for inactivation of bacteria[2]. There are different methods which are used for sterilization process[3] and recently the DBD based technology is found more effective and stable for the same[4]. We have developed a single barrier DBD cell using a quartz tube of dia 22mm and length 120mm. The quartz material acts as a dielectric with low dielectric loss and high breakdown strength. Six numbers of 2 mm wide linear strips of titanium gold are coated using magnetron sputtering technique on the diametrical opposite portions of outer surface of the quartz tube which act as anode. A helical tungsten electrode of thickness 0.75mm, dia10mm has been used as cathode on which a pulsed high voltage signal up to ~ 5kV/30kHz with 2 µsec pulse width has been applied to strike the discharge. The outer striped electrodes are grounded. The characterization of the homogeneous mode of the developed DBD cell has been carried out using electrical and optical emission spectroscopy diagnostics. At low voltages frequent microdischarges has been observed. When the peak voltage is raised, additional microdischarges have struck in between the spacing and at the high voltage microdischarges merged together and lead to form homogeneous discharge. A series of experiments has been carried and decontamination study of autoclaved water has been performed. The results are encouraging which will be presented.

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