This thesis following up the studies about decontamination effects of low-temperature plasma generated by corona discharge. Two species of bacteria, Escherichia coli and Staphylococcus epidermidis, were exposed in two separate sets of experiments. Bacterial suspensions were treated by point-to-plane corona discharge directly on surface of semisolid culture medium, the Mueller-Hinton agar, placed in Petri Dishes of 5 cm diameter.
The point electrode was realized by the tip of a 0.7 mm syringe needle, connected to the source of direct current high voltage. The plane electrode was formed by the surface of an ion-conducting semisolid cultivation medium. A micrometer screw allowed precise setting the 4 mm distance of the point electrode from the anode surface.
The samples were exposed to the corona discharge with current of 25μA - 150μA range. The treatment duration is given by constant exposed charge (18, 27, 36 and 54 mC) condition.
After exposition, all Petri dishes were immediately cultivated at 37 ºC overnight. After cultivation followed evaluation of inhibition zone areas, that was caused by action of electric charge. The state of the cultures was quantitatively assessed by measuring of the growth inhibition zones, where a complete growth inhibition took place.
The behaviors of these exposures were investigated. Motivation of these measurements was considering or rejection of following hypothesis: Is the size of the inhibition zone areas given only by the magnitude of exposed the electric charge for various initial currents? This hypothesis was tested by a balanced two-way ANOVA and rejected ($p<0.05$) for both tested bacteria cases.