

دراسة بعض الخصائص الفيزيائية للتفريغ الكهربي المتوهج لغاز النيتروجين

(N_i)

(T_e)

$(EEDF)$

(N_i)

(T_e)

(T_e)

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Abstract

This research is concerned with the study and measurement of some physical properties of the negative glow discharge, normal glow discharge generated between two parallel electrodes, electron temperature, ion density and electron energy distributing function.

The electron energy distributing function will be examined using curves of single Langmuir probe, while electron temperature and density of ions will be derived from the characteristic curves for both single and double probes.

The practical study was done to evaluate the breakdown voltage at deferent pressures and distances to evaluate the Minimum voltage for breakdown of gas, to find the range of gas pressure at which following making measurements.

The study of discharge characteristic curves of gas, the relation between the volt and current, at different pressures also the distance between two electrodes to specify the volt and the current needed to obtain the electric discharge glow.

Study of the relation between the volt and current for the single probe, at different pressures and different discharge current, to evaluate the electron temperature T_e , ions density N_i and electron energy distributing function (EEDF).

Also study the relation between the volt and current for the double probe at different pressures and current will be done to calculation the electrons temperature T_e , ion density N_i .

In the end made comparison between the results of single and double probe and effect of change the pressure and current on the results.

The results in this study show the agreement of the behavior with the result published before. The temperature of electrons T_e as a function of gas pressure for each single and double probe decreases as pressure increases and it is increases with increasing the discharge current. Also the ion density for both the single and double probe measurements decreases as gas pressure increased and it increases when the discharge current increased

The electrons energy distribution function in the negative glow region doesn't follow Maxwell distribution.