microwave torch as a method for plasma treatment of cathode surfaces [[1]](#footnote-1)\*)

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An important element of high-power repetitively pulsed non-chain HF (DF) lasers initiated by a self-sustained volume discharge (SSVD) is the electrode system, which must provide stable laser operation [1–3]. The use of silicon carbide (SiC) cathodes can significantly increase the homogeneity and stability of the SSVD in the working media of electrochemical lasers [3]. However, to obtain the most homogeneous SSVD under these conditions, it is necessary that a small-scale relief ~ 50 μm be present on the cathode [1-3]. The creation of small-scale irregularities is a significant problem because of the high hardness of SiC. It makes it difficult to machine the cathodes of this material. Therefore, it seems to be a very actual task to study the possibility of using plasma surface treatment both from silicon carbide and from metals (Ti, Al) to create cathodes with a relief.

The purpose of this work was to study the possibility of using the microwave torch [4, 5] as a method for plasma treatment of cathodes (SiC, Ti, Al). The parameters of the microwave torch (gas temperature, temperature and electron concentration) are given for plasma gases such as argon and air. The physical aspects of the processes occurring during the contact of the plasma with the surface are discussed.

References

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