

EFFECTIVE APPLICATION OF PLASMA LIGHTING FACILITY BASED ON ELECTRODELESS SULFUR LAMP FOR ELECTRICAL REGENERATION

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Today, due to the intensive depletion of fossil resources on Earth, there is a need to use renewable energy sources. The most interesting is the photoelectric conversion of solar energy into electrical energy. Although the Sun is the largest source of energy on Earth and supplies 99.98% of the total energy of our planet, however, the intensity and spectral distribution of its radiation depends on geographical location, climatic, weather, and seasonal conditions, etc. Therefore, in the process of our life, artificial light sources are often used. Modern light sources must satisfy a number of parameters, combining high luminous efficiency and efficiency of generated radiation (a wide range of spectral distribution and color rendering), durability and environmental friendliness with low cost and variety of applications fields.

The plasma lighting facility with a sulfur lamp is a powerful light source having a quasi-solar emission spectrum and providing light fluxes of ~140 klm, and a color temperature of about 6400 K. Also the electrodeless lamp with microwave excitation has the ability to control the radiation power, which allows imitating the modes of sunrise and sunset.

Electrodeless sulfur lamps can be used together with other electronic devices for creating the power energy-efficient lighting systems. It is proposed to use a lighting facility based on an electrodeless sulfur lamp with microwave excitation combine with solar batteries that are located indoors (for example, greenhouses). This gives several advantages: first, it facilitates the maintenance of solar batteries (protection from various natural phenomena); secondly - with the reduction in the number of sunny days, increases the need to use artificial light (for example, for supplementary lighting plants in greenhouses), however, if the lighting devices have a spectrum close to the sun, then solar batteries can more efficiently produce electricity.

Therefore, such a use of the plasma lighting facility enables the regeneration of electricity to light by converting its optical radiation into an electric current using solar batteries. This will save energy and reduce the cost of production in general (for example, when growing agricultural products).