PLASMOCHEMICAL EFFECTS AND SOME FUNDAMENTAL PROBLEMS OF THE PHYSICS OF GAS DISCHARGES

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S u m m a r y

Some fundamental problems of investigations of gas discharges are analyzed from the viewpoint of their energotechnological applications. As examples of the specific real or potential application, this work considers the technologies of surface modification of constructional materials and those of the plasma conversion of fuel. For the realization of the former, one widely uses low-pressure glow or arc discharges, while the latter require atmospheric-pressure arc discharges. A general comparison of the properties of glow and arc discharges from the viewpoint of their energy efficiency is performed. It is shown that the key problem for both understanding the physical processes running in these objects and the target searches for the most efficient technological solutions lies in the study of ion-molecular reactions in the region of the interaction of plasma with a solid-body surface or the environment, where the electric arc is maintained.