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Afterglow in high frequency capacitive discharge with/without nanoparticles[1] IRINA SCHWEIGERT, Institute of Theoretical and Applied Mechanics SB RAS — After switching off the plasma of the high frequency discharge decays due to ambipolar diffusion process. The characteristic time of plasma relaxation is different for pristine and dusty plasma since the effective surface for electrons and ions loss in dusty plasma is substantially larger. Additionally the negatively charged massive nanoparticles visibly affect the diffusion process. In this work we study the plasma relaxation in discharge afterglow with using PIC MCC method for different gas pressures. The simulations are performed for pure argon plasma and for plasma with a monodisperse ensemble of nanoparticles ranging from 40 to 200 nm in size. The charge of nanoparticles is calculated from the balance equation for electron and ion flux on the nanoparticle surface. The charge of nanoparticles varies over the discharge volume and decreases with time. It is shown that the characteristic time of plasma decay becomes less with decreasing gas pressure and the presence of nanoparticles essentially enhances the rate of plasma decay.

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