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Electron heating and control of electron energy distribution in hybrid plasma source for the enhancement of the plasma ashing processing

HYO-CHANG LEE, CHIN-WOOK CHUNG, Department of Electrical Engineering, Hanyang University — In this study, control of the electron energy distribution function (EEDF) is investigated in hybrid plasma source with inductive and capacitive fields. With the addition of a small amount of antenna coil power to the capacitive discharge, low energy electrons are effectively heated and the EEDF is controlled. This method is applied to the ashing process of the photoresistor (PR). It is revealed that the ashing rate of the PR is significantly increased due to O radicals produced by the controlled EEDF, even though the ion density/energy flux is not increased. The roles of the power transfer mode, the electron heating, and the discharge parameters are also presented in the hybrid plasma source. This work can be used to an inter-ashing method during etching process.

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