Abstract Submitted
for the GEC17 Meeting of
The American Physical Society

O atom kinetics in RF CCP oxygen plasma at increased pressures[1] ANDREY VOLYNETS[2], Department of Physics, Lomonosov Moscow State University, Russia, DMITRY LOPAEV, OLGA PROSHINA, TATYANA RAKHIMOVA, ALEXANDER RAKHIMOV, Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Russia, MICROELECTRONICS DIVISION OF SINP TEAM — In this study, the 80 MHz symmetric CCP discharge in quartz tube was used as a source of pure O_2 plasma of increased pressures (10 to 100 Torr). This research is mainly focused on the balance of O atoms that is governed by processes of O_2 dissociation and O atom loss. The use of time-resolved actinometry technique in the modulated discharge allowed experimentally determining dissociation rate constant k_{diss}^{O2} and atom loss frequency γ_{loss}^{O}. The O atom loss is connected with surface recombination at lower pressure and volume reactions at higher pressure. The variation of plasma parameters allowed varying gas temperature from 500 K up to 1800 K and this allowed to study the O atom generation and loss mechanisms in a wide range of gas conditions. The behavior of k_{diss}^{O2} at low E/N and the role of ozone in γ_{loss}^{O} is discussed in detail.

[1]This research is supported by Russian Foundation for Basic Research (RFBR) Grant No. 16-52-16024.
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Date submitted: 01 Jun 2017 Electronic form version 1.4