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O atom kinetics in RF CCP oxygen plasma at increased pressures[1] ANDREY VOLYNETS, DMITRY LOPAEV, OLGA PROSHINA, TATIANA RAKHIMOVA, ALEXANDER RAKHIMOV, Skobeltsyn Institute of Nuclear Physics, Lomonosov Moscow State University, Russia — In this study, the 81 MHz symmetric CCP discharge in quartz tube at increased pressures (10 to 100 Torr) was used to study O_2 dissociation mechanism. The use of both spatially resolved and time-resolved actinometry technique on Kr in the modulated rf discharge allowed measuring atom loss frequency ${\nu_{loss}}^O$ and dissociation degree and thereby determining dissociation rate constant ${k_{diss}}^{O2}$. The O atom loss is connected with surface recombination at lower pressure and volume reactions at the higher pressure. The variation of plasma parameters allowed studying the O_2 dissociation and O atom loss mechanisms in a wide range of gas temperature from $\sim$ 500 K up to 1800 K. The possible mechanism of increasing ${k_{diss}}^{O2}$ at low E/N as well as the role of ozone generation in ${\nu_{loss}}^O$ is discussed in detail.

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