

Abstract Submitted
for the GEC10 Meeting of
The American Physical Society

Mass-spectroscopical study of plasma-assisted thermal degradation of poly(ethylene oxide)¹ ANDREI CHOUKOUROV, IVAN GORDEEV, DMITRY ARZHAKOV, DANKA SLAVINSKA, HYNEK BIEDERMAN, Charles University in Prague, Faculty of Mathematics and Physics — PEO-like plasma polymers were deposited by vacuum evaporation of PEO with simultaneous activation of its vapors by a glow discharge. Mass-spectroscopy was applied to elucidate the mechanisms of thermal degradation of PEO. Without the plasma, the gas phase is rich with oligomers of PEO with m/z reaching 102. The mechanism of radical termination by disproportionation is detected. Application of the plasma results in significant fragmentation of released species. The films deposited without plasma have the chemical composition close to original PEO yet with molecular weight distribution shifted to lower values. The plasma polymers lose the PEO character with increasing power of discharge. The parameters of the deposition are optimized to obtain the PEO-like plasma polymers with high retention of the PEO structure. Such films are found to perform non-fouling in terms of adhesion of blood plasma proteins.

¹The work was supported by the grant GACR 202/08/8158.

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Date submitted: 25 May 2010

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