Abstract Submitted
for the GEC12 Meeting of
The American Physical Society

Dissociative electron attachment to triflates[1] SYLWIA PTASINSKA, University of Notre Dame, DAVID GSCHLIESSER, PETER BARTL, Innsbruck University, IRENEUSZ IANIK, University of Notre Dame, PAUL SCHEIER, STEPHAN DENIFL, Innsbruck University — It is known that understanding of chemical transformations induced by low energy electrons reacting with photoresist components is crucial for effective design of chemically amplified resists in modern lithography. Therefore in present work gas phase studies on dissociative electron attachment to simple alkyl ($CF_3SO_3CH_3$) and aryl ($C_6H_5SO_3CF_3$ and $CF_3SO_3C_6H_4CH_3$) triflates were carried out. The fragmentation pathways under electron impact below 10 eV were identified by means of crossed electron-molecular beam mass spectrometry. Several reaction channels were observed upon an electron capture by the studied compounds, involving single or multiple bond cleavages or intramolecular rearrangement. Three main dissociation channels were observed that are C-O, S-O or C-S bond breakage in the triflate moiety leading to the formation of triflate (OTf), triflyl (Tf) or sulfonate (RSO_3) anions, respectively. The results of this work can be helpful at later stage in the improvement of the image quality in post optical lithography processes.

[1] This research was supported by the Division of Chemical Sciences, Geosciences and Biosciences, Basic Energy Sciences, Office of Science, United States Department of Energy through grant number DE-FC02-04ER15533

Sylwia Ptasinska
University of Notre Dame

Date submitted: 15 Jun 2012 Electronic form version 1.4