Abstract Submitted
for the GEC15 Meeting of
The American Physical Society

Gas Phase Dissociative Electron Attachment to Formamide Derivatives NMF and DMF[1] ZHOU LI, M. MICHELE DAWLEY, SYLWIA PTASINSKA, University of Notre Dame — Fragmentation of biomolecules, such as nucleobases, induced by low energy electrons can lead to the break of DNA strands. Dissociative electron attachment (DEA), which can occur due to low energy interactions, is initiated with the formation of transient negative ions which exhibit characteristic resonant profiles in the product ion yield. The consequent fragmentation process can either be as simple as a single bond cleavage or a relatively complex process involving multiple bond rearrangements. Measurements of resonant peaks in ion yields and identification of ion products provide information of the resonant energies of the parent molecules as well as the fragmentation pathways. N-methylformamide (NMF) and dimethylformamide (DMF) are both derivatives of formamide which is the simplest structure containing the peptide bond linkage. In this work we identified anion fragments and measured resonance profiles of produced anions due to DEA to NMF and DMF. The anionic species produced from the two molecules were compared as well as the resonant positions and ion yields. Based on this comparison, the DEA process to the two molecules bears similarities such as leading to breaking of peptide bonds (C-N), as well as discrepancies such as absence of OCN^- in DEA to DMF. The selective property of H atom loss, which is reported in the DEA to formamide, is also justified in our experiment since no dehydrogenated DMF anion was detected.

[1]This material is based upon work supported by the U.S. Department of Energy Office of Science, Office of Basic Energy Sciences under Award Number DE-FC02-04ER15533.

Zhou Li
University of Notre Dame

Date submitted: 19 Jun 2015 Electronic form version 1.4