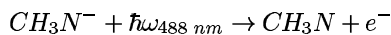


PHOTOELECTRON STUDIES OF METHYLNITRENE, CH₃N

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Complex organic radicals are important intermediates in many combustion and environmental processes. In combustion processes, the organic radical CH is known to cleave N₂ into HCN and N atoms. Most N atoms are further oxidized to NO which exhausts into the atmosphere. Thus the reaction of CH with N₂ to produce N atoms connects internal combustion engines with NO production. Some fraction of these N atoms, however, reacts with CH₃ in the flame to produce CH₃N. Methylnitrene is very unstable and decomposes to generate CH₂NH or H₂ + HCN. We will discuss the use of negative ion photoelectron spectroscopy to characterize methylnitrene.



We find $EA(CH_3N) = 0.022 \pm 0.009$ eV. In addition to detaching the methylnitrene anion to the ground state of CH₃N (\tilde{X}^3A_2), we also detect the first electronically excited state of methylnitrene, \tilde{a}^1E . We measure $\Delta E(\tilde{a}^1E - \tilde{X}^3A_2) = 1.352 \pm 0.011$ eV. The reaction dynamics of nitrene rearrangements will be discussed:

