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Abstract for an Invited Paper
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Dissociative Electron Attachment to Gas-Phase Molecules.[1]

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Recently, we designed and developed an experimental technique to identify neutral radicals formed from decomposition following the dissociative electron attachment to gas phase molecules [1]. This process plays a significant role in nature and technology and has attracted a large amount of scientific attention in recent decades. Although numerous research groups around the world have probed the effects of low energy electrons on molecular fragmentation in the past, to date, due to experimental limitations, there has been no direct detection of the accompanying neutral radical species. To overcome this challenge, we initiated experiments using our newly developed stepwise electron spectroscopy to reveal a comprehensive picture of the dissociation process. We initially tackled a model molecule, carbon tetrachloride, but will continue on to a wide range of key molecular compounds. The detection of neutral radicals is essential for developing a thorough understanding of many research topics ranging from the elucidation of mechanisms in DNA damage (e.g., radiation damage to living organisms) [2] to improvements in high-resolution nanolithography (e.g., development of industrial applications). [1] Z. Li, A.R. Milosavljevic, I. Carmichael, S. Ptasinska, "Direct Observation and Characterization of Neutral Radicals from a Dissociative Electron Attachment Process" Phys. Rev. Lett. 119 (2017) 053402 [2] J.D. Gorfinkiel, S. Ptasinska "Electron scattering from molecules and molecular aggregates of biological relevance" J. Phys. B 50 (2017) 182001

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