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**Application of Laser Induced Electron Impact Ionization to the $SiH_4$-$NH_3$ Hot Wire Chemical Vapor Deposition System.** BRETT EUSTERGERLING, MARTIN HEDEN, YUJUN SHI, University of Calgary — The application of a laser induced electron ionization (LIEI) source in studying the gas phase chemistry of the $SiH_4$ – $NH_3$ hot wire chemical vapor deposition system has been investigated. By directing an unfocused laser beam containing 118 and 355 $nm$ radiation to the repeller plate in a Wiley-McLaren type time-of-flight mass spectrometer, photoelectrons were successfully liberated from the stainless steel plate. The large electric field in the ion optics region accelerated these photoelectrons, resulting in the ionization of species which are unavailable by the 118 $nm$ single-photon ionization route (SPI, 10.5 $eV$). In all mixtures studied, it was found that any species with an ionization potential below 10.5 $eV$ , e.g. $Si_2H_6$ and $NH_3$, were observed most strongly when pure SPI was used, whereas peaks corresponding to those species with IP's above 10.5 $eV$, e.g. $H_2$, $N_2$ and He, were strongest when LIEI was employed. Further investigations using a custom built, variable-energy photoelectron source will also be presented.

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