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Substitution effects in strong and ultrastrong field photoionization of chloromethane and dichloromethane PATRICK GRUGAN, NAGITHA EKANAYAKE, BRUCE WEN, SAMANTHA WHITE, LAUREN HOWARD, SARA LEMAR, ZACH CONDON, PANPAN RUAN, ZACHARY BOND, ROSIE SCALZI, CAITLIN MCCOWAN, ANTHONY TRAMONTOZZI, IVETTE PLANELL-MENDEZ, ALEJANDRO LONDONO, ALEX DANIELS, MATTHEW DECAMP, BARRY WALKER, University of Delaware, Newark Delaware 19716, USA — We investigate the intensity dependence of carbon ion fragments from chlorinated species of methane in strong and ultrastrong laser fields up to 5x10^{18} W/cm^2. C^{n+}, $1 \leq n \leq 5$, yields are all reduced in chlorinated species when compared to the production from methane [1]. Larger molecular ions ex. CH_2^{2+}, which are common to both gas species ionized at 10^{15} W/cm^2, show a marked difference between all species indicating the pathways of molecular ionization [2] are different. At ultrahigh intensities ionization is expected to be free from molecular effects; however we observe the substitution suppression effect extends to highly charged C^{5+} ions at intensities above 10^{18} W/cm^2. This work is supported by the Army Research Office under Award No. W911NF-09-1-0390 and National Science Foundation under Award No. 0757953. MFD acknowledges support from the DOE-EPSCoR grant DE-FG02-11ER46816.

[1] S. Planiyappan et.al. PRL 100, 183001(2008)
[2] Z. Wu et. al. J. Chem. Phys. 126, 07431(2007)

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