**Title:** **Identification and quantification of potentially hazardous chemicals emitted by Consumer 3D printers.**

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| **Abstract:** Additive manufacturing, or “3D printing” is a method of fabricating three dimensional objects in a layer-by-layer fashion using a computer-generated file as a blueprint and a small printing device for construction. Previously limited to the medical and manufacturing sectors, 3D printing technology is now widely used by hobbyists. One of the more prominent and less studied forms of printing is masked stereolithography (mSLA). The process employed by mSLA involves ultraviolet light-catalyzed polymerization of proprietary resin formulations which emit compounds into the headspace that may pose a risk to the operator. To identify and quantify the compounds in the emission, a chamber was constructed and the gas volume of this chamber was pulled through polyurethane foam (PUF) media. The PUF media was extracted with dichloromethane. For the purposes of identification, the extracts were analyzed by Gas Chromatography- Mass Spectrometry. With the assistance of spectral database matching and standards analysis, five compounds have been identified: 2-Hydroxyethyl Acrylate, 4-Acryloylmorpholine, Mesityl Aldehyde, Tolylene-2,4-Diisocyanate and 2,6-Di-tert-butyl-p-cresol. For the purposes of quantification, GC-Flame Ionization Detection (GC-FID) was used. Four printing phases were assessed separately: pre-printing, during printing, wash phase, and the curing phase. Surprisingly, the pre-printing phase generated similar emissions levels (20μg-3715μg) to the during phase (15μg- 6453μg). |

POSTER session preferred, main author is a graduate student.