**Presentation title:** Identification and Quantification of Potentially Hazardous Chemicals Emitted by Consumer “3-D’ Printers

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**Platform preferred**

3D printing, or additive manufacturing, 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. Printers fall into two broad categories: fused deposition modeling (FDM) and masked stereolithography (mSLA). While FDM has been studied, studies focused on emissions from mSLA printing are limited. The process employed by mSLA involves ultraviolet light-catalyzed polymerization of proprietary resin formulations; this polymerization emits compounds into the surrounding atmospheric environment that may pose a risk to the operator. Here, we describe the identification and quantification of the compounds in the emissions before, during and after the operation of a mSLA printer. Monitoring of the printer emissions was performed with two media, polyurethane foam (PUF) plugs and solid phase microextraction needles (SPME). Through Gas Chromatography-Mass Spectrometry and spectral database matching, five compounds were detected during the prining phase: 2-Hydroxyethyl Acrylate, 4-Acryloylmorpholine, Mesityl Aldehyde, Tolylene-2,4-Diisocyanate and 2,6-Di-tert-butyl-p-cresol, confirmed by standards analysis. All five of the identified compounds cause respiratory irritation at low concentration per the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), in addition to more serious hazards:H351 (Suspected of causing cancer), H361 (Suspected of damaging fertility or the unborn child) and H373 (Causes damage to organs through prolonged or repeated exposure). Quantifying these compounds in the headspace of the printing process will help assess the danger of exposure to the operator.