

## EXPLORING THE CHEMICAL COMPOSITION OF AEROSOLIZED eLIQUID THROUGHOUT THE LIFETIME OF ELECTRONIC NICOTINE DELIVERY SYSTEMS.

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Electronic nicotine delivery systems (ENDS) were introduced as a healthier option to traditional cigarettes, however concerns about their safety remain.<sup>1</sup> By comparison, ENDS produce a nicotine containing aerosol rather than generating a flame or smoke, and therefore reduces the user's exposure to tobacco smoke related toxicants [1,2]. The components of ENDS include a metal heating element and liquid-containing cartridge that consists of propylene glycol (PG) and/or glycerin (GLY), flavorings, organic acid, and nicotine as the main ingredients [2]. As the ENDS device is used, undesired and harmful carbonyls and aldehydes can be generated due to thermal decomposition of PG and GLY [2]. Exposure to these compounds can contribute to cardiovascular illness and lung related complications [1]. Additionally, coil deterioration with continued usage can lead to decreased efficiency for nicotine delivery, and unwanted leaching of components into the eLiquid [2]. Herein, the composition of organic and inorganic products in aerosols generated from eLiquid pods were explored, as a function of ePod usage. Gas chromatography-mass spectrometry (GC-MS) and inductively coupled plasma-mass spectrometry (ICP-MS) were used to identify and quantify the decomposition products or metals in the captured aerosol, respectively. Data suggests gradual changes to the concentrations of ingredients in the eLiquid throughout the lifetime of the pod, and significant levels of metal. Overall, this research provides valuable insights into the chemistry related to ENDS, which may inform consumers, industry, and government.

[1] Uchiyama, S., et al. *Anal. Sci.* (2016), 32:549–555.

[2] Saleh Q.M., et al. *Int. J. Environ. Res. Public Health*, (2021), 18:4380.