

GAS CHROMATOGRAPHY-MASS SPECTROMETRY (GC-MS) ANALYSIS OF FOUR CARCINOGENS IN CIGARETTE SMOKE.

Nelsy Carcamo¹, Joelle Kirsch², Risa Robinson², and Todd Pagano*¹¹RIT/NTID Laboratory Science Technology Program, ²RIT Department of Mechanical Engineering- Rochester, NY. nmc2583@rit.edu, tepnts@rit.edu

The analysis of smoke particulate matter was performed on four different kinds of cigarettes: University of Kentucky Reference, Marlboro Filtered, Marlboro Filtered Lite, and Eclipse “safer” cigarettes. The cigarette smoke was generated using a smoking machine built by colleagues in RIT’s Department of Mechanical Engineering. Samples were collected on silicate filter pads and run through a detailed extraction procedure before being analyzed by Gas Chromatography-Mass Spectrometry (GC-MS). The analytes of interest are four suspected carcinogens and EPA priority pollutants: Benz[a]anthracene, Benzo[b]fluoranthene, Benzo[k]fluoranthene and Benzo[a]pyrene. The major developments in this research were the optimization of the GC-MS instrumentation and extraction procedure involving Solid Phase Extraction (SPE)-based techniques. Deuterated molecules of the four carcinogens were used as internal standards and calibration curves were established in order to quantify concentrations in the collected smoke samples. Additional focus was on the chromatographic resolution of Benzo[b]fluoranthene and Benzo[k]fluoranthene using the GC-MS. This work, supported by the American Cancer Society, will help researchers understand the deposition of carcinogens in the lungs that are resultant of the smoking process.