

**Abstract:**

Air pollution has become one of the major issues of our time. Many studies have shown a correlation between particulate concentration and health. When considering the fact that organic compounds make a significant, and often predominant, contribution to the total atmospheric particulate mass, it becomes clear; study of the formation and reaction pathways of organic aerosols is of great importance. A novel instrument, bipolar laser desorption/ionization aerosol mass spectrometer, b-LDI-AMS, has been developed in the Petrucci laboratory with the potential to greatly advance the investigation of aerosol formation and reaction pathways. Due to the novelty, it must be fully characterized (i.e. reproducibility, standard operating procedure etc.) before its potential can be fully realized. Experiments were undertaken over a 10 week period using a mixed particle system of oleic acid and octadecyl amine as well as a mixed particle system of several amino acids to measure the analytical figures of merit of the b-LDI-AMS. Characterization performed includes obtaining a clear and reproducible signal, mass spectra produced from amino acid analysis, and development of a new data acquisition system.