

# PORTABLE MASS SPECTROMETER

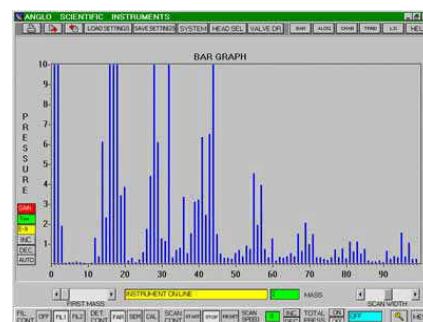
## TECHNOLOGY OVERVIEW

The subject technology involves a hand-held portable mass spectrometer utilizing the Loeb-Eiber mass filtering device. The device is designed to operate at pressures above 1 millibar (0.75 Torr) to eliminate the usage of a turbo or ion pump and only requires a small roughing pump for operation. It operates on continuous low power consumption of 100 Watts and without high RF amplitudes. The construction is a laptop sized model with a maximum dimension of 1 ft<sup>3</sup> and weight of less than 30 lbs. Software manipulation will be used to run the instrument as well as record and interpret the data. The spectrometer is functionally compatible with miniaturization standards and provides superior resolution to portable Ion Mobility Mass Spectrometers. It can detect gas-phase neutrals (having a concentration greater than 1 part per million) and gas-phase ions from the atmosphere using a robust and flexible ion source.

## POTENTIAL FIELDS OF USE

The technology can have useful applications in several areas:

- Biotechnology: Analysis of proteins and DNA
- Pharmaceuticals: Discovery of drugs, analysis of chemicals
- Clinical: Neonatal screening, drug testing, blood analysis
- Geological: Oil composition testing, mineral analysis
- Defense Applications: Identification of chemical warfare agents, illegal drugs and explosive residues
- Environmental: Water quality testing



## BENEFIT ANALYSIS

The proposed prototype has several advantages over the existing models:

- Reduces production costs by eliminating requirements for a turbo/ ion pump and sizable matching networks/ amplifier circuits for filtering noise.
- Facilitates on-site analysis due to lower weight and robust construction.
- Increased reliability of the analysis due to higher resolution of the spectrometer.
- Cost effectiveness of the prototype increases its viability for commercial mass production and applications in teaching.

## STAGE OF DEVELOPMENT

The technology is at an early stage of development. Researchers have successfully simulated Eiber's work in the laboratory to show marked improvement in the Signal to Noise Ratio (SNR) which establishes greater efficiency of the suggested device. The patent is awaited for the construction of the prototype. Additional research needs to be pursued prior to achieving commercialization of the device.

## FUTURE DEVELOPMENT

Ongoing research is being performed to test other options that can be incorporated into the technology with emphasis on maximizing mass resolution, using alternative approaches to mass-selective scanning and using alternate ion sources. In the near future, highly advanced data analysis tools will be employed to interpret the unique spectra obtained by the device. Also, a detailed database will be constructed which will be used to indicate the probability of match of the sample with the closest related compound.

## LICENSING OPPORTUNITIES

The patent for the proposed technology is pending. Licensing opportunities are available.

**For more information contact:**

Ohio University  
Technology Transfer Office  
340 West State Street, Unit 11, Athens, OH 45701  
T: 740.593.0462, F: 740.593.0186  
tto@ohio.edu

