AL FISCHER

CHEM 370 LAB MANUAL

Contents

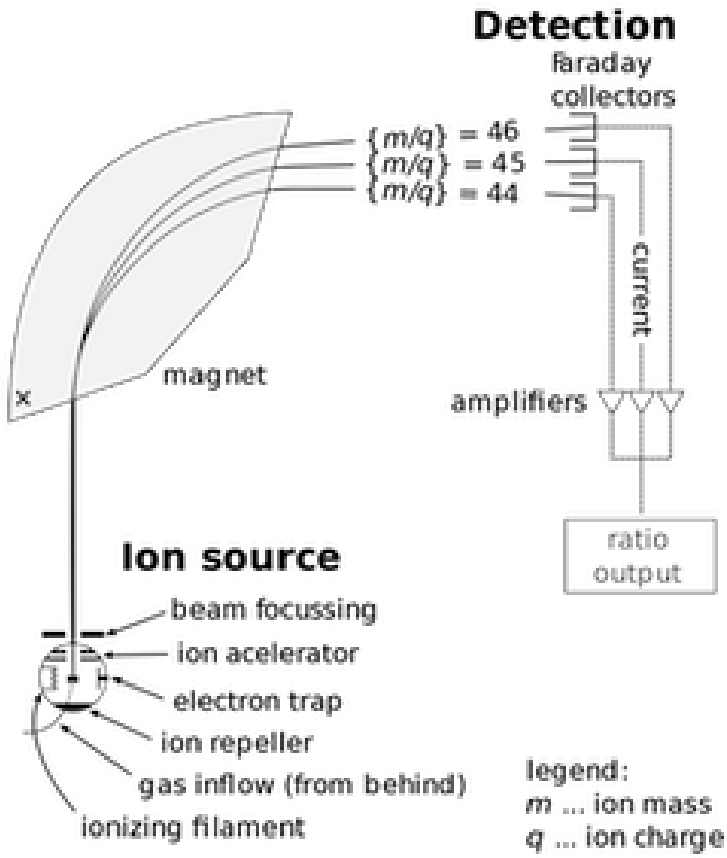

Figure 1: Public domain image of mass spectrometer.

Overview

This course is an introduction to instrumental analysis in the chemistry lab. Students will be introduced to components of the "analyst's toolbox" through real-world scenarios, including spectroscopy, mass spectrometry, and chromatography. Students will conduct sample preparation, instrument calibration, and qualitative and quantitative analysis using UV-visible spectroscopy (UV-vis), gas-chromatography/mass spectrometry (GC-MS), high-performance liquid chromatography (HP-LC), flame atomic absorption spectroscopy (FAAS), and Fourier-transform infrared spectroscopy (FT-IR). Throughout the semester, students will also work to develop skills related to reproducible data analysis, scientific communication, and collaboration in the laboratory. Prerequisites include CHEM-232 (Quantitative Analysis) and CHEM-242 (Organic Chemistry II).

Lab Activities

Students will work in pairs at the beginning of the semester to complete introductory labs involving spectroscopy and gas chromatography. After that, they will be assigned groups of 2-3 with which they will complete one rotation lab that lasts the remainder of the semester. Students may choose to analyze e-cigarette liquid or acetaminophen tablets for their rotation lab. The rotation lab are scenario-based, so students should refer to the memorandum at the beginning of each rotation for details. The lab activities for the rotation lab are:

Vape Juice	Acetaminophen
GC-MS (ID flavor)	HPLC (Quantify acetaminophen, check purity)
AA (Quantify Metal)	FTIR (Check for Adulterants)
FTIR (Check for Adulterants)	GC-MS (ID flavor)
HPLC (Quantify Nicotine, check purity)	AA (Quantify Metal)