United States Environmental Protection Agency

Office of Research and Development

# National Human Exposure Assessment Survey (NHEXAS)

## *Region 5 Study*

# Quality Systems and Implementation Plan for Human Exposure Assessment

Research Triangle Institute
Research Triangle Park, NC 27079

Cooperative Agreement CR 821902

**Standard Operating Procedure** **NHX/SOP-184-002**

**Title:** Tuning of the HP-5988A Mass Spectrometer

**Source:** Research Triangle Institute

U.S. Environmental Protection Agency
Office of Research and Development
Human Exposure & Atmospheric Sciences Division
Human Exposure Research Branch

| STANDARD OPERATING PROCEDURE | RESEARCH TRIANGLE INSTITUTE<br>POST OFFICE BOX 12194<br>RESEARCH TRIANGLE PARK, NC 27709-2194 | NHX/SOP-184-002<br>Page 1 of 4 |
|---|---|---|

**TITLE:** STANDARD OPERATING PROCEDURE FOR TUNING OF THE HP-5988A MASS SPECTROMETER

**SOURCE:** Research Triangle Institute
Post Office Box 12194
Analytical and Chemical Sciences
Research Triangle Park, NC 27709-2194

**AUTHOR(s):**

Jeffrey T. Kreuer Date: 10/16/96

_____ Date: _____

_____ Date: _____

**APPROVED BY:**

Principal Investigator: E Pellizzari Date: 10/16/96

QA Officer: Doris Smith Date: 10/16/96

**STATUS:**

IN PROGRESS: ☐

DRAFT: ☐

FINAL VERSION: ☒

**REVISIONS:**

| No. | Date | No. | Date |
|---|---|---|---|
| 0 | 3/31/94 | 6 | |
| 1 | ‡ | 7 | |
| 2 | | 8 | |
| 3 | | 9 | |
| 4 | | 10 | |
| 5 | | 11 | |

‡ Effective date of this version is the date of the last approval signature; revision 0 is the original version.

# STANDARD OPERATING PROCEDURE FOR THE TUNING OF THE HP-5988A MASS SPECTROMETER

## TABLE OF CONTENTS

## 1.0 INTRODUCTION

The following SOP outlines the basic conditions and procedures for tuning the HP-5988A mass spectrometer for 70ev electron-ionization (EI) mass spectrometry. A complete description of the tuning procedures available to the system users is outlined in detail in Reference 1. In an effort not to reiterate the instrument manual, this SOP outlines the basic procedures necessary for tuning the mass spectrometer for EI analysis. Chemical ionization (CI) tuning involves many specific details unique to a project and is therefore not fully described here. The specifics of (CI) tuning are fully described in Reference 1 and should be followed as outlined by the instrument manufacturer.

### 1.1 Autotuning

Autotuning is an automated tuning program incorporated in the HP-RTE data system used by the 5988A mass spectrometer. This program automatically adjusts the mass spectrometer parameters to obtain a mass spectrum of the compound PFTBA (perfluorotributylamine) to meet predefined performance parameters. The ions 69, 219 and 502 are used by AUTOTUNE to adjust the instrument to produce spectra sufficient to assess resolution and calibration of the mass spectrometer.

### 1.2 Manual Tuning

Manual tuning is possible via the MTUNE option included in the HP-RTE data system. The user may select various options available in the tuning program to optimize the mass spectrometer performance in regards to either resolution and/or sensitivity in a particular mass range. Often upon the initiation of the new project or immediately following instrument repair an AUTOTUNE is performed on the mass spectrometer as a fast method of initially adjusting the instrument parameters. This is followed by manual adjustments to increase the abundance of the ion signal for increased sensitivity where required. Once established, the tune should be checked each day during which project samplers are to be analyzed.

The options available to the user affect the various mass spectrometer parameters. These parameters vary voltages on the mass spectrometer source, lenses, analyzer and

detector as described in Reference 1. Adjustments to any of the available parameters may affect the mass resolution and sensitivity and therefore should be assessed after each change.

## 2.0 DOCUMENTATION

For each new mass spectrometer tune, a tune file should be created and given a unique filename. An output copy containing the mass width/axis information and full scan mass spectrum generated from the tune parameters must be recorded.

## 3.0 CORRECTIVE ACTION

Upon the detection of a mass spectrometer tuning problem, the mass spec supervisor shall be notified. Appropriate action to resolve the problem will be decided at that time. If the corrective action affects the sample analysis and/or data obtained the mass spec supervisor will notify the appropriate project supervisor and QA Officer immediately.

## 4.0 REFERENCES

Hewlett-Packard HP 59872 GC/LC/MS RTE-A DATA SYSTEM MANUAL: Publication No. 59872-90103.