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Research Triangle Institute
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Standard Operating Procedure **NHX/SOP-184-001**

Title: Maintenance of the Hewlett-Packard 5988A GC/MS System

Source: Research Triangle Institute

U.S. Environmental Protection Agency
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Human Exposure Research Branch

TITLE: STANDARD OPERATING PROCEDURE FOR MAINTENANCE OF THE HEWLETT-PACKARD 5988A GC/MS SYSTEM

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1.0 ROUTINE MAINTENANCE

1.1 Vacuum System

The vacuum system is comprised of two direct drive Edwards vaccum pumps for rough vacuum conditions and two oil diffusion pumps for high vacuum conditions. The direct drive pumps should have their oil checked on a regular basis and completely replaced on a yearly basis. The oil diffusion pumps require little maintenance other than a yearly check of the oil levels as specified in the Hewlett-Packard hardware manual. Specifications for all oil and maintenance are outlined in the HP Hardware and Service Manual sections 1-7.

1.2 Mass Spectrometer Source

Maintenance of the mass spectrometer source includes the cleaning of all stainless parts as described in the HP Hardware and Service Manual Sections 1-7. Ceramic parts should be replaced with new or pyrolytically cleaned ceramic parts. Damaged, warped or broken filaments should be replaced.

1.3 HP 5890 Gas Chromatograph

Routine maintenance for the gas chromatograph includes replacement of the glass injection-port liner and septa prior to the beginning of each project. all gas tight connections should be leak checked prior to the injection of samples. Capillary columns are to be installed as described in the HP 5890A Gas Chromatograph Reference Manual Volumes 1 and 2.

2.0 DAILY TUNING CRITERIA FOR THE MASS SPECTROMETER

The daily performance of the HP 5988A is assessed by the stability of the FC-43 mass spectral tune. Upon the initiation of a task or maintenance of the mass spectrometer, a tune file is established which is evaluated to access the performance of the instrument. Information extracted from the FC-43 tune includes mass width and mass assignments of the ions 69, 219 and 502. In addition the absolute abundances of these ions obtained in a full scan mode, as specified by the HP tune program, is monitored as a method to assess daily detector response variations. Daily records of the abundances of these ions are recorded in a log so as to monitor any significant variations.

3.0 CORRECTIVE ACTION

Upon the detection of any hardware problems by the mass spec operators, the mass spec supervisor is to be notified. Appropriate action to resolve the problem will be decided at that time. If the event affects the sample analysis and/or data obtained the mass spec supervisor will notify the appropriate project supervisor and QA Officer immediately. All repairs or corrective actions shall be recorded in the instrument log books.

4.0 DOCUMENTATION

Maintenance records for the Hewlett-Packard 5890 Gas Chromatograph and 5988A Mass Spectrometer shall be maintained. All routine maintenance, upgrades and emergency replacement parts shall be recorded including dates and personnel.

5.0 REFERENCES

The following Hewlett-Packard manuals include all relative maintenance information for the gas chromatograph/mass spectrometer system: HP 5890A Gas Chromatograph Reference Manual Vol. 1&2 (HP Part No. 05890-90110).

HP 5988A Mass Spectrometer Hardward Manual (Publication No. 05988- 90009).