

NASA SBIR/STTR Technologies

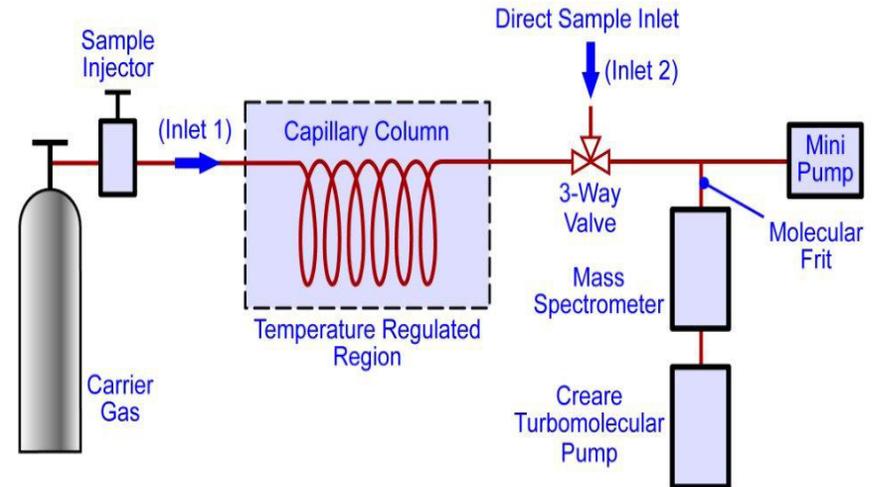


X1.01-9003 - Miniature Gas Chromatograph Mass Spectrometer for In-Situ Resource Utilization

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Identification and Significance of Innovation

In situ resource utilization (ISRU) is essential for several of NASA's future flagship missions. ISRU processes require heating of the regolith to high reaction temperatures. To support ISRU activities, NASA requires the development of a compact, lightweight gas chromatograph-mass spectrometer (GC-MS) instrument that can quantify volatile gases released by sample heating below atomic number 70. The instrument must also be designed to withstand exposure to the release of HF, HCl, or Hg that may result from heating regolith samples to high temperatures.



Estimated TRL at beginning and end of contract: (Begin: 3 End: 4)

Technical Objectives and Work Plan

Technical Objectives

1. Determine the GC-MS measurement requirements.
2. Select optimal mass analyzer system technology.
3. Select optimal auxiliary technologies.
4. Develop a conceptual system design.

Work Plan

- Task 1. Determine System Requirements
- Task 2. Design Prototype GC-MS
- Task 3. Test Performance of Prototype GC-MS
- Task 4. Develop Conceptual System Design
- Task 5. Manage and Report

NASA Applications

The main application area for NASA for the proposed gas chromatograph for ISRU plants will be for future missions to Mars and the Moon.

Non-NASA Applications

The primary private sector application for the proposed gas chromatograph mass spectrometer system is for use in performing portable chemical analysis, particularly when looking for harmful gases.

Firm Contacts

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NON-PROPRIETARY DATA