

MOMA field test at AMASE

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Abstract

The gas chromatograph and electronics part of the Mars Organic Molecule Analyser of the 2018 ExoMars mission will be tested during the Arctic Mars Analog Svalbard Expedition 2010.

1. Introduction

Detection and identification of organic molecules derived from present or past life is the goal of the Mars Organic Molecule Analyser of the 2018 ExoMars mission of ESA. One part of the instrument is a pyrolysis gas chromatograph mass spectrometer pyr-GC-MS while the other is a laser desorption mass spectrometer. In the pyr-GC-MS a soil sample of app. 200 mg can be mixed with small amounts of chemical reagents [1] and then heated to a temperature of 900°C. During this process the organic molecules either desorb from the surface or react with above mentioned reagent forming volatile organic molecules, capable to be separated on the column of the GC and identified in the MS.

The direct pyrolysis of soil samples or the chemical derivatization without previous extraction is an uncommon way of sample preparation.

2. MOMA at AMASE

The Arctic Mars Analog Svalbard Expedition is a well established test campaign to give the instrument teams of Mars missions of ESA and NASA a possibility to test the instruments.

The performance and stability of the gas chromatograph of the MOMA instrument will be tested during the two week AMASE campaign in August 2010 on Svalbard. The cooperation with other instruments teams to select interesting samples for the pyrolysis-GC measurements will also be part of the campaign. The rock crushing tool of the ExoMars mission is planned to do part of the sample

preparation. After crushing of the material the sample will be loaded into an oven. The further procedure of heating and data collection will be done by a PC interfaced to the instrument electronics. The performance of the GC on several sample types will be tested as well as the functionality and the usability of the electronics.

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References

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