Title : the integration of the GC into the space nature identification
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Introduction :

the construction of the rovers is broadly linked to the environment , geographic situation into outer space , available materials and it is based on the techniques and the methods adapted to the essential need to find a conception that limit the vibration and presents more resistance and advantages , for the EMIRS model the simulation is used to expect thermal-infrared spectrum from the surface and atmosphere of Mars and this method is adapted to help plan EMIRS observation , similarly the GC can be easily utilized to separate and identifies the atmosphere composition in addition help encounter the problems of some instruments ?

the exploration of the dynamics of the Martian atmosphere on a global scale needs the development of special engines composed of fundamental parts , each one is complement to the other in order to represent different requirement for the spatial resolution which is based on the retrieval algorithms that quantifies the interaction light- matter to make the observation direct of the atmosphere through the use of any remote sensing instrument in the case of the EMM temperature vapor abundance will all be retrieved from thermal -IR spectra observed by the

EMIRS instrument to provide a global coverage [1], but specific measurement might be possible by using the atypically the gas chromatography to test the purity of a particular substance , its separation and quantification after moving the sample by the mobile phase which is available in the atmosphere (helium), although the retention time would be influenced by the nature of the atmosphere .

materials and methods

according to the EMM state , the unmanned observatory which was lunched on July 20,2020 was lunched into an orbit carrying 3 instruments around Mars : EMIRS simulator , CRISM , EMUS and all of them are linked to spectroscopy principle based on mass to charge ratio of the ions , but in a different MS procedure due to the factors that influences the molecules behavior caused by magnetic field ,more over one of the factors that shows the importance of the integration of the GC in the methods of experimentation is the nature of the Martian atmosphere which is characterized by the a lower atmosphere on a global scale and its geographic, diurnal and seasonal variability , in the other hand the rates of thermal ,photochemical atmospheric escape with conditions in the collisional Martian atmosphere and the spacial structure and variability of key constituents in the Martian exosphere [2]

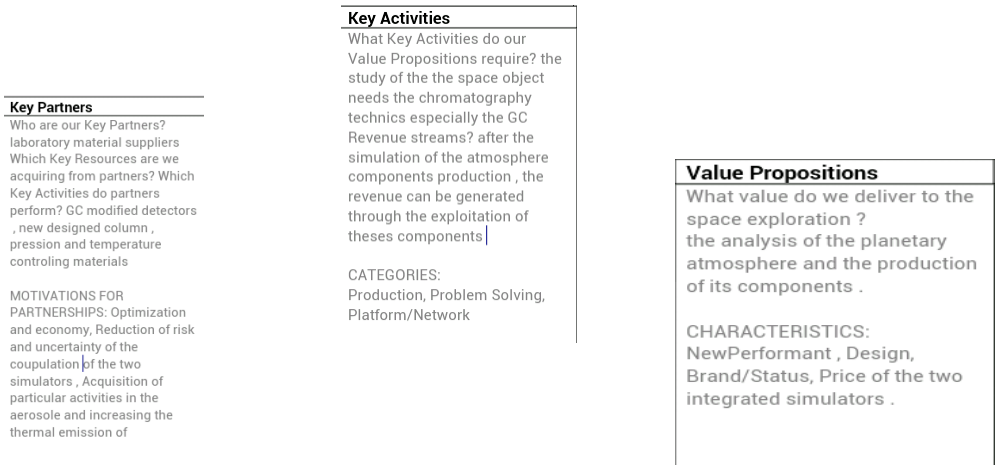
in addition , the column used for chromatography can not only chromatography what is inside a complex sample but also can simulate the formation of such gazes through the transfer of the information obtained from the graph of the detector response from the space in the laboratory by using the adverse mechanism that interpret the response into the formation of the separated gazes from the graph by assembling the pure sample then the condensation of the different separated gazes in the opposite direction of the separation so the GC conception contains different parts in different places , this leads to the necessity to study the instrument and the requirements imposed by the conditions such as the energy consumption , the volume of the instrument , the nature of the mobile and the stationary phases as well as the efficiency , for that reason the spacial observation hope utilized CRISM retrievals to report the evidence of the sharp increase in the water vapor and consequently the exigency are established for the thermal volatilization and the pretreatment of the sample .

Results and discussion :

the innovation of the instruments to improve the installed GC probes of planetary atmosphere helps determine the uncertainty in atmospheric quantities as well as the EMIRS instrument because both of the methods can be coupled to the mass spectrometry and the analysis is being used to guide development of retrieval algorithms for dust and water ice optical depth [3].

EMIRS simulator uses a discrete ordinates formulation to treat multiple scattering by aerosols [4]

and as a part of the development of the EMIRS simulator , we can integrate the GC small column inside the aerosols and we consider a minimum interaction between the instrument and the radiation streams that are used in the discrete ordinates formulation of the radiative transfer



conclusion :

through this crossing of the images , this article exercise draws up a possible observation of the integration of the two techniques in order to give more information about the analysis and open new doors for the simulation of the space atmosphere .

Referance :

book:
Gas chromatography in space exploration 2012 , university of ferrara

website:
agu.org
[1] ,[2] ,[3] ,[4] planetry science
Emirates Mars mission 2020 EMIRS overview