ID de Contribution: **26** Type: **Oral presentation**

Derivatization of amines in preparation for Dragonfly mission

mercredi 10 février 2021 16:15 (15 minutes)

Titan is one of the most promising worlds for astrobiology in our solar system. Its thick atmosphere is the site of a complex and rich chemistry that leads to the formation of a photochemical haze. This haze precipitates at the surface [1] where a wide range of reactions can occur. Titan's surface is composed of water ice [2] which can melt under certain conditions (meteoritic impact, cryovolcanism) leading to the presence of liquid water. The interaction between liquid water and photochemical aerosols could give rise to complex molecules that could be the buildings blocks of life (as we know them). Among this molecules, there could be some that carry an amine function [3] such as amino acids [4] (or even peptides) and nucleic acids [5]. These molecules are the elementary units of our proteins and our DNA. Therefore, if theses molecules are really present on the surface of Titan, the Dragonfly probe will have to be able to detect and identify them by gaz-chromatography-mass-spectrometry (GCMS). In order to do this, Dragonfly will carry on board different sample preparation processes such as pyrolysis or derivatization. These techniques aim to improve the analytical efficiency of the GCMS. This work will be focus on derivatization and more precisely on derivatization of amines. Here, we will show that the derivatization process allow to improve the detection as well as the quantification of amines. Besides, we will investigate on the optimisation of the derivatization procedure according different kind of molecules such as peptides and nucleotides. This aspect of the work allow us to show that the DraMS instrument could analyse such molecules at the surface of Titan. Finally, we will present an analysis of tholins (lab analogs of Titan) which has undergone the derivatisation process. This last point will show the complexity of the molecules that we expect to find on Titan.

REFERENCES
[1] Hörst, S. M. (2017). " Titan's atmosphere and climate " Journal of Geophysical Research: Planets.
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[5] Pilling et al., (2009). " DNA Nucleobase Synthesis at Titan Atmosphere Analog by soft X-rays." Journal of Physical Chemistry.

Field

Planetology (including small bodies and exoplanets)

Day constaints

I am not available to make my presentation monday afternoon and friday afternoon. Thanks !

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Classification de Session: Talk

Classification de thématique: Astrophysics