



MOMIE : Martian Organic Material Irradiation and Evolution

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Among the biomarkers we seek on Mars, the organic molecules are primordial because they are necessary to the origin of life as we know it. However, these molecules (except methane recently discovered) have never been detected on Mars by the in situ analyzes of the Viking landers. A key question is to know if organic molecules are indeed present, in which concentration and under which form. Indeed, even if endogenous organic molecules were never synthesized, those brought by exogenous sources, like interplanetary dust, should be present in detectable amount. Moreover, the track of the endogenous organic molecules should not be dropped out because these molecules are able to resist over periods of several billion years without being degraded.

It thus appears that organic molecules could be present at the surface of Mars, even if they have significant chances to undergo a partial or total chemical evolution. Within the framework of a search for organic molecules by present or future space experiments, we are developing the MOMIE project (Martian Organic Material Irradiation and Evolution) in order to determine how the organic species evolve on the Martian surface. We thus propose to implement this type of research with the assistance of an experimental setup designed for the study of the behaviour of organic molecules under conditions simulating as close as possible conditions of Mars surface. The main parameters are the atmospheric chemical composition, the surface temperature and pressure, the soil chemical composition and the irradiance flux and spectrum. We will here present the first results obtained with this device, called MOMIE.