

Viking landers did detect organics on Mars

January 6 2011, by Lin Edwards



A boulder-strewn field of red rocks stretches across the horizon in this self-portrait of Viking 2 on Mars' Utopian Plain. (3 September 1976) Image: NASA

(PhysOrg.com) -- In 1976 the NASA Viking landers took samples of soil on Mars and tested them for signs of organic carbon. A reinterpretation of the results now suggests the samples did contain organic compounds, but the results were not understood because of the strong oxidation effects of perchlorate, a salt now known to be found in Martian soils.

In the Viking tests the Martian [soil](#) was heated sufficiently to vaporize [organic molecules](#) in the soil and the resultant gases and vapors were

analyzed by gas chromatography-mass spectrometry.

Chlorohydrocarbons were found at landing site 1 and 2, but they were dismissed at the time as terrestrial contaminants, even though they were not found at the same levels in blank runs. Then, in 2008 the Phoenix lander discovered perchlorate in the Martian arctic soil. Perchlorates are well known as powerful oxidizing compounds that combust organics, but their presence in Martian soils was not suspected in the 1970s.

After the Martian soils were found to contain perchlorates, scientists from Ciudad Universitaria in Mexico City, and [NASA](#)'s Space Science Division at Moffett Field, California, decided to test the soils of the Atacama Desert in Chile, which is considered more like Mars than anywhere else on Earth.

The research, reported in the *Journal of Geophysical Research*, found that when soil samples containing organic carbon were mixed with magnesium [perchlorate](#) and then heated, the same kind of combusted chlorohydrocarbons were found as had been detected on Mars by the Viking lander and dismissed as contaminants.

Reinterpreting the Viking results in the light of the new findings suggests the samples from landing site 1 contained 1.5 to 6.5 ppm organic carbon, while those from landing site 2 contained 0.7 to 2.6 ppm organic carbon.

The presence of organic material does not provide evidence of life or past life on Mars but only of the presence of [organic compounds](#). NASA is now planning a new mission for November 2011 to have another look for organics and other chemicals on Mars in an effort to better understand the chemistry of Martian soils.

More information: Navarro-González, R., E. Vargas, J. de la Rosa, A. C. Raga, and C. P. McKay (2010), Reanalysis of the Viking results suggests perchlorate and organics at midlatitudes on Mars, *J. Geophys.*

Res., 115, E12010, [doi:10.1029/2010JE003599](https://doi.org/10.1029/2010JE003599)

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