



Hints of Organic Salts on Mars



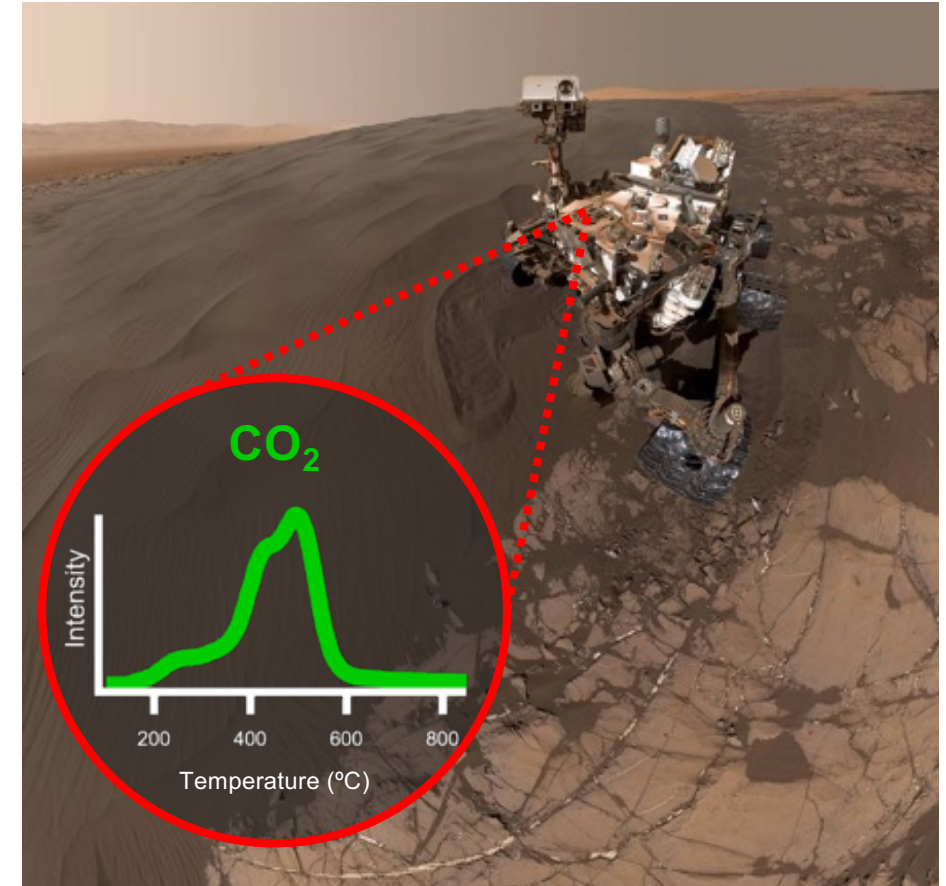
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A NASA team has found that organic salts are likely present on Mars. Like shards of ancient pottery, these salts are the chemical remnants of larger organic compounds. Finding organic molecules, or their organic salt remnants, is essential in NASA's search for life on other worlds. But this is a challenging task on the surface of Mars, where billions of years of radiation have erased or broken apart organic matter. Like an archeologist digging up pieces of pottery, Curiosity collects Martian soil and rocks, which may contain tiny chunks of organic compounds, and then instruments such as SAM (Sample Analysis at Mars) identify their chemical structure.

Scientists predicted that organic molecules (including large ones associated with life) could be breaking down into salts, which more likely to persist on the Martian surface. In their laboratory at Goddard, the team analyzed a range of organic salts mixed with silica powder to replicate a Martian rock. They also added perchlorates to the silica mixtures. Perchlorates are salts containing chlorine and oxygen, which are common on Mars and may interfere with experiments seeking signs of organic matter. Indeed, researchers found that perchlorates did interfere with their experiments, and they pinpointed exactly how. Using this data, they found that their results, specifically the carbon dioxide emitted by the rocks when baked, better matched SAM data when organic salts were present, bolstering the likelihood that organic salts are present on Mars.

Besides adding more evidence to the idea that there once was organic matter on Mars, directly detecting organic salts would also support modern-day Martian habitability, given that on Earth, some organisms can use organic salts for energy.

Lewis, J. M. T. et al., (2021), *JGR: Planets*, 126, <https://doi.org/10.1029/2020JE006803>



Curiosity rover investigating the Bagnold Dune Field in Gale crater. SAM analysis of the dune materials showed multiple CO₂ peaks, which were similar to the peaks produced by organic salts in the laboratory.

Image credit: NASA/JPL-Caltech/MSSS.