

## Martian salts not bad for life: scientists

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Courtesy NASA and World Science staff

Scientists with NASA's Phoenix Mars mission spoke Tuesday about an ongoing investigation of perchlorate salts detected in soil analyzed by the Phoenix Lander.

"Finding perchlorates is neither good nor bad for life, but it does make us reassess how we think about life on Mars," said Michael Hecht of NASA's Jet Propulsion Laboratory, Pasadena, Calif..

Researchers said they spoke out in response to recent news reports claiming the discovery had damaged the prospect for life on Mars. The mission team had wanted to perform additional checks on the finding before reporting on it, but said the news reports prompted them to speak out now.

Hecht is lead scientist for the Microscopy, Electrochemistry and Conductivity Analyzer or MECA, the instrument that includes Phoenix's wet chemistry laboratory. If confirmed, the result is exciting, Hecht said, "because different types of perchlorate salts have interesting properties that may bear on the way things work on Mars if—and that's a big 'if'—the results from our two teaspoons of soil are representative of all of Mars, or at least a significant portion of the planet."

"The Phoenix project has decided to take an unusual step" in talking about the research when its scientists are only about half-way through the data collection, said Phoenix principal investigator Peter Smith of the University of Arizona, Tucson.

"We decided to show the public science in action because of the extreme interest in the Phoenix mission, which is searching for a habitable environment on the northern plains of Mars," Smith added. "Right now, we don't know whether finding perchlorate is good news or bad news for possible life on Mars."

Perchlorate is an ion, or charged particle, that consists of an atom of chlorine surrounded by four oxygen atoms. It is an oxidant, that is, it can release oxygen, but it is not a powerful one. Perchlorates are found naturally on Earth at such places as Chile's hyper-arid Atacama Desert. The compounds are quite stable and do not destroy organic material under normal circumstances, researchers said. Some microorganisms on Earth are fueled by processes that involve perchlorates, and some plants concentrate the substance. Perchlorates are also used in rocket fuel and fireworks.

Perchlorate was discovered with a multi-use sensor that detects perchlorate, nitrate and other ions. The MECA team saw the perchlorate signal in a sample taken from the Dodo-Goldilocks trench on June 25, or Sol 30, or the 30th Martian day of the mission after landing, and again in another sample taken from the Snow White trench on July 6, or Sol 41.

The additional checks were being done with another lander instrument, the Thermal and Evolved Gas Analyzer or TEGA, which heats soil and analyzes gases driven off. When TEGA heated a sample of soil dug from the Dodo-Goldilocks trench on Sol 25 to high temperature, it detected an oxygen release, said TEGA lead scientist William Boynton of the University of Arizona.



Perchlorate could be one of several possible sources of this oxygen, he said. Late last week, when TEGA analyzed another sample, this one from the Snow White trench, the TEGA team looked for chlorine gas. The instrument detected none. "Had we seen it, the identification of perchlorate would be absolutely clear, but in this run we did not see any chlorine gas. We may have been analyzing a perchlorate salt that doesn't release chlorine gas upon heating," Boynton said. "There's nothing in the TEGA data that contradicts MECA's finding of perchlorates." As the Phoenix team continues its investigation of the arctic soil, the TEGA instrument will attempt to validate the perchlorate discovery and determine its concentration and properties.

*Image; The Phoenix landing site on northern Mars as photographed from the lander. (Image credit: NASA/JPL-Cal tech/U. of Arizona/Texas A&MU.)*