

Organic Compounds from an Ancient Martian Lakebed

What is the science question? Is there organic matter preserved in ancient Mars rocks?

What are the findings? Using the SAM instrument on the Curiosity rover, we have found the sulfur-containing compound thiophene as well as several other aromatic and aliphatic compounds preserved in mudstones created billions of years ago in a martian lake environment.

What is the impact? Even in the harsh radiation environment of the surface of Mars, we are able to discover additional organic compounds. The sulfur-rich environment may have preserved some of these molecules from destruction and others may have been produced from breakdown of macromolecules, similar to those found in coal and meteorites. The organic matter could be from ancient martian life, but it is not evidence of life. The organics could also be from abiotic sources.

Why does it matter to non-scientists? Finding organic compounds has been a major Mars exploration goal ever since the 1976 Viking mission. Our results motivate the search for molecular biosignatures preserved in rocks from ancient water-rich environments.

