



## Habitable Resources and Organic Elements on Mars

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### DESCRIPTION

The Red Planet is a cold, desert planet with a thin atmosphere. But the dusty, lifeless planet is anything but dull. Phenomenal dust storms can engulf the entire planet temperatures can drop so low that carbon dioxide in the atmosphere condenses directly into snow or frost, and marsquakes the Mars version of earthquakes occurs on a regular basis. Mars is the fourth planet from the sun and has two unusual moons, as well as a distinctive rusty red appearance. Mars bright rust colour is due to iron-rich minerals in its regolith, which is the loose dust and rock that covers its surface. Earth's soil is also a type of regolith, albeit one with a high organic content. The iron minerals oxidise, or rust, causing the soil to appear red. Because of the planet's cold, thin atmosphere, liquid water is unlikely to exist on the Martian surface for an extended period of time. Some scientists believe that recurring slope lines may have spurts of briny water flowing on the surface, but this evidence is debatable; others believe that hydrogen spotted from orbit in this region may instead indicate briny salts. This means that, despite being half the size of Earth, this desert planet has the same amount of dry land.

The Red Planet is home to the solar system's highest mountain as well as the deepest and longest valley. Olympus Mons is roughly 17 miles (27 kilometres) high, roughly three times the height of Mount Everest, while the Valles Marineris system of valleys named after the Mariner 9 probe that discovered it reaches as deep as 6 miles (10 kilometres) and runs east-west for

roughly 2,500 miles (4,000 kilometres), roughly one-fifth the distance around Mars and close to the width of Australia. Mars also has the largest volcanoes in the solar system, one of which is Olympus Mons. The massive volcano, which measures about 370 miles (600 kilometres) in diameter, is large enough to encompass the entire state of New Mexico. Olympus Mons is a shield volcano with gradual slopes similar to Hawaiian volcanoes, formed by lava eruptions that flowed for long distances before solidifying. There are numerous other types of volcanic landforms on Mars, ranging from small, steep-sided cones to vast plains covered in hardened lava.

Phobos, like the smaller moon Deimos, is a small rocky body that exists independently of Mars. Many charged atoms and molecules, such as oxygen, carbon, nitrogen, and argon, escape and flow off the thin Martian atmosphere into space. Some of these charged particles, known as ions, eventually collide with phosphides. Phobos is spiralling toward Mars, getting closer to the Red Planet by about 6 feet (1.8 metres) every century. Phobos will either collide with Mars or break up and form a ring of debris around the planet in 50 million years. Mars lost its global magnetic field about 4 billion years ago, allowing the solar wind to strip away much of its atmosphere. However, there are regions of the planet's crust that are at least ten times more strongly magnetised than anything measured on Earth, implying that those regions are remnants of an ancient global magnetic field.

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**Received:** 17-Oct-2022, Manuscript no: JAO-22-19181; **Editorial assigned:** 19-Oct-2022, PreQC no. JAO-22-19181(PQ); **Reviewed:** 31-Oct-2022, QC no. JAO-22-19181; **Revised:** 07-Nov-2022, Manuscript no. JAO-22-19181(R); **Published:** 17-Nov-2022, DOI: 10.35248/2332-2519.22.10.269.

**Citation:** Chen C (2022) Habitable Resources and Organic Elements on Mars. *J Astrobiol Outreach*.10:269.

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