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Opinion Article

Valuable Ore Resource on Mars

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ABSTRACT

Mining companies conduct geochemical and mineralogical analysis on soil and drill samples. Geophysical methods like seismic, magnetic and airborne surveys, are commonly will not detect and delineate underground ore bodies. The surface of Mars has fascinated generations of science and therefore the hope of a suitable hostile, extra-terrestrial colony as humanity begins its long journey towards an interplanetary civilization referred to as bio signature. Mineralization on Mars our nearest neighbor in space and really similar to Earth in many ways. Mars surface temperature and pressure hovers round the point liquid water considered essential for life can exist. Microbes on Earth use carotenoids to guard themselves from harmful UV light and there's a great need for that on Mars because its atmosphere is so thin it doesn't filter out the UV light coming from the sun. Mars is assumed to contain numerous mineral resources like magnesium, aluminum, titanium, iron, chromium, lithium, cobalt, nickel, copper, zinc and lots of more.

Keyword: Geophysical methods; Extra-terrestrial colony; Martian meteorites; Cosmo chemistry; Astrobiology

DESCRIPTION

The Martian regolith is formed up of an apparently homogenized dust having (broadly) basaltic composition with admixed local rock components, oxides (e.g. hematite) water-bearing phyllosilicates and salts (mainly sulfates). The basalts within the northern plains are in general rich in sulfur and variably enriched in bromine relative to chlorine, indicating a past interaction with water. Quartzofeldspathic materials even have been identified. Water extracted from Martian meteorites, as a way for removing CO_2 from the Martian atmosphere and sequestering it in the crust as carbonates and as a possible origin for iron oxide-rich spectral units on the floors of some rifted basins (chasmata). Orbit-based mineral detections were initially interpreted as indicating persistent wetter climates with greater water availability during the oldest epochs (Noachian), which produced phyllosilicates followed by episodically wet conditions in later periods (Hesperian) conducive to the assembly of sulfate salts and a lot of locations on Mars host secondary phases that include clay minerals, sulfates, crystalline iron oxides, opaline silica, zeolites, and carbonates even diamonds are generated from pre-existing carbon for instance graphite, within the target rocks. They're often polycrystalline, yet harder than mantle derived diamonds. The surface became more acidic, suppressing the formation of phyllosilicates and carbonates and resulting in the hematite and sulfates an intense volcanic activity would have acidified the environment and led to the precipitation of part of the sulfates. Hematite is the dominant component of many iron ore these sulfate deposits may be have formed from volcanic degassing of sulfuric acid mixing with water. In light of the likelihood that Mars has a significant cryosphere of ground ice and permafrost and that the interaction of magmatic S_2, SO_2 and H_2S with such a cryosphere could end in hydrothermal circulation. They indicated that the oxidation of iron may schematically be described in terms of the change of the ferrous component of iron-bearing precursor phases into oxide. Fe-Mg smectite are usually related to the lowest stratigraphic horizons and are overlain by aluminous smectite. Large igneous provinces, volcanoes and impact craters hold significant potential for nickel, copper, iron, titanium, platinum group elements and more. They found that sulfate minerals contain between 0.03 and 0.69% organic carbon also as high ppb to low ppm abundances of amino acids.

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CONCLUSION

But Earth-based exploration models must be adapted to account for the massive differences in the climatic and geological history of Mars. The amount of minerals unambiguously identified on Mars surface is still extremely scarce and their texturalrelationships are not well understood.

The interdisciplinary study of potential Mars analogues and on Earth hydrothermal systems, evaporated areas, acidic rivers, impact craters, mineralizing submarine and hydrocarbon vents, etc., are helping us to acknowledge the great variety of geological and mineralogical frameworks.