



## Thermodynamic study of a martian cave

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We have analyzed the habitability conditions in a Martian cave from a thermodynamics point of view. Our model includes more than 50 atmospheric reactions (including those involving traditionally considered biomarkers such as H<sub>2</sub>O or CH<sub>4</sub>), and the interaction between surface-atmosphere. For these reactions we have estimated their entropy production and Gibbs free energy.

Martian caves are places with unique environmental conditions (possible presence of liquid water, shield against UV radiation, stable temperature, ...) that makes them as a good potential locations to find life on Mars. The study of the time-dependence of these thermodynamic quantities provides us with a complete tool to study their past and present habitability.